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AN OVERVIEW
OF
COMPATIBLE LAND USE PLANNING TECHNIQUES
FOR MILITARY AIR INSTALLATIONS

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TABLE OF CONTENTS

Chapter One - Introduction 1

1.1 General 1
1.2 Presentation of Analysis 3

Chapter Two - Encroachment 5

2.1 Concept 5
2.2 Sources 7

Chapter Three - Land Use Compatibility Program 13

3.1 Program Overview 13
3.2 Program Elements 14

Chapter Four - AICUZ Program 18

4.1 Program Overview 18
4.2 Legal Aspects 22
4.3 Noise 26

4.3.1 Noise Science 27
4.3.1 Measurement and description 31

4.4 Accident Potential 33

4.5 Land Use Compatibility 43

Chapter Five - AICUZ Implementation Strategies 55

5.1 Basic Strategies 55

5.1.1 Noise Control 55
5.1.2 Land Use/Development Controls..... 58

5.1.2.1 Zoning 62
5.1.2.2 Restrictive Easements 64
5.1.2.3 Land Purchase 68

5.1.3 Navy Acquisition Policy 68

Chapter Six - Conclusion 73

Appendix A - Jacksonville Florida Case Study 75

References 89

CHAPTER ONE
INTRODUCTION

1.1 General

The Department of Defense (DoD), as an executive agency of the federal government, assumes a multitude of responsibilities in the execution of its national defense mission. Providing the policy and direction to the subordinate military services, the Army, Navy , Air Force and Marine Corps, to achieve this end, is a massive undertaking.

The highly visible tactical and strategic military forces, which project the American presence worldwide, are viable primarily due to a large and diverse support infrastructure which exists to support these forces. The logistical support requirements to sustain the operational components, consisting of ships, aircraft and ground forces, are critical to their sustainability and effectiveness during both peacetime and war.

Much of DoD's support infrastructure is embodied in the thousands of military installations which are located worldwide. These bases, both in the United States and overseas, must ultimately coexist harmoniously within the framework of the local environment. This is particularly true for those bases located in the U.S. which depend on direct interrelationships with the local economies,

environment and government. The traditional sovereign nature of a federal military installation does not isolate it from the surrounding region. DoD has an important and pervasive role as a fellow landowner and employer in the community. As a responsible landowner, DoD must recognize the requirement to be compatible with the external environment beyond the perimeter fence.

The inherently dangerous nature of many military installations often appears to be at odds with the typically peaceful setting of the surrounding community. Ammunition depots, air installations, shipyards, etc. are often cited as being incompatible with local community development. DoD assumes the responsibility to mitigate the dangerous or unsafe aspects of these installations and, through a variety of strategies, provide a reasonable standard of safety. Indeed, it is incumbent upon DoD to maintain and operate its bases in the safest fashion possible without detracting from those bases' particular national defense missions.

Perhaps nowhere today is the question of DoD's landowner responsibility more visible than at the hundreds of military air installations. Airfields, in general, are viewed as being incompatible with all but the most rural regions (1:1). Other than the flying activities, which present high noise pollution and some accident potential, air bases accomodate many other potential threats to the surrounding community. Extensive munition stockpiles, vast

amounts of stored volatile fuels and conveying pipelines certainly are the most overt. However, the potential affects of noisy ground testing procedures, air, water and ground pollution, just to name a few, are equally dangerous, albeit in a more insidious fashion.

DoD is acutely aware of its responsibility to minimize the public's exposure to the hazards associated with air installations while simultaneously protecting the operational capabilities of its bases. Accomplishing this mutual goal is not a simple feat. Rather, it is a large complex problem with many dynamic and interactive elements.

1.2 Presentation of Analysis

The purpose of this paper is to evaluate the planning processes associated with ensuring compatible land use development adjacent to military air installations with a predominate focus on Naval air installations. The subject of compatible land use development is extremely complex and this paper can only touch upon the more basic scientific, administrative policy and legal questions which arise. The sections devoted to aspects of noise, for example, are an attempt to simplify complex theories without sacrificing technical merit.

After presenting an overview of encroachment and land use issues, along with the associated strategies to foster

compatible development, this paper will evaluate the land use compatibility problems currently being encountered by the Navy in the Jacksonville, Florida region.

CHAPTER TWO
ENCROACHMENT

2.1 Concept

Webster's dictionary defines the term encroachment in the following manner ... "To enter or force oneself gradually upon anothers property or rights." In the military arena, incompatible development or encroachment is occurring with increasing frequency on privately owned and some publically owned lands contiguous to military air installations (2:1). Base operations can be adversely impacted and ultimately, unchecked encroachment can result in the unplanned closure of the air base itself.

Of all the military services, the Navy faces perhaps the most intense encroachment pressure because the majority of its air stations are located in coastal areas which have experienced disproportionally high growth rates (2:1). The Secretary of the Navy (SECNAV) has broadly defined encroachment as it relates to Naval shore installations in general.

> "Any non-Navy action planned or executed in the vicinity of a Naval activity or operational area which inhibits, curtails, or possesses the potential to impede the performance of the mission of the Naval activity."

Viewed in this context, encroachment is a pervasive problem which spans the entire fabric of virtually all Naval shore bases.

Sites for most Naval air stations were selected many years ago in areas which were relatively remote from urban centers. However, since World War II, with the unprecented growth of coastal population centers, the problems of civilian encroachment pressures have become magnified to the extent that many air stations are seriously threatened today (20:4100-1).

Curtailing or halting operations at some air stations because of off-base residential or commercial development are examples of encroachment problems which have progressed beyond the stage of effective control. Other examples of potential encroachment activity include new highway construction, industrial expansion and commercial/private airport operations. Paradoxically, these and other similar developments often act as magnets which attract even more people into formerly unpopulated areas adjacent to the hapless Naval air station. The manifestation of these developments lies in the fact that communities are becomming increasingly critical of aircraft noise, safety and other base generated concerns. This is resulting in increasing pressure being applied by local government and citizens groups to restrict or shutdown flight operations (20:4100-1).

The pervasive nature of the encroachment threat, to Naval air stations in particular, is one of the most serious problems facing the Navy today (11:1). Understanding the

full scope and impact of encroachment is a prerequisite to the design of proactive counter measures.

2.2 Sources of Encroachment

To aid in the review of encroachment's broad spectrum, it is helpful to categorize the sources into five general categories (20:4150-1):

1. Population growth and land development
2. Competition for scarce resources
3. Environmental and intergovernmental regulation
4. Legislative encroachment
5. Mission and other changes

Although these categories overlap to some degree, they collectively describe the nature of the encroachment threats faced by many Naval shore activities today.

The first general source of encroachment is population growth and land development pressures. This is particularly acute in the coastal zones, metropolitan areas and the sun belt where the preponderance of the Navy's air stations are located.

The former Naval Air Station (NAS) Los Alamitos, in southern California, is the classic example of an activity whose mission was choked off by the population explosion in Orange County and the resultant residential development that pushed out the Naval aviation function (19).

A more current example is NAS Barbers Point, in the state of Hawaii, which is being pressured by neighboring private development. The Campbell estate, the major private landowner around the air station, has enlisted congressional support in its attempts to force the Navy to permit development incompatible with the operation of the air station. In addition to the $46 million dollar potential litigation, NAS Barbers Point may also be forced to alter its operations adversely, or even to cut back significantly (18:IV-1).

As populations grow in the vicinity of the Navy's air stations, pressures often arise to use the military air facilities jointly with the private sector. In the case of Marine Corps Air Station (MCAS) El Toro, also in southern California, the airfield represents the only site convenient to Orange County's population centers where additional civil air capacity could be developed at a reasonable cost to the local taxpayers. This situation virtually assures continued pressures to develop joint use of MCAS El Toro and possibly other similar air stations in urban settings (18:III-6).

The Navy anticipates continued pressures from incompatible land developments around its air stations where demographics and accompanying development pressures are on the upswing. This paper will later examine various strategies to mitigate, through compatible land use planning techniques, these types of encroachment problems.

The second category of encroachment is competition for scarce resources and the community and political pressures that result. In addition to land, scarce resources can consist of energy sources, port facilities, beachfront and airspace. The Navy and Marine Corps have to, in some instances, compete and negotiate with other elements of the public and private sector to maintain control over these resources (20:4150-1). Air space encroachment, for example, is increasingly becomming a concern to many air stations.

Environmental and intergovernmental legislation and regulations have created the third category of encroachment problems for the Navy. The freedom of action in dealing with resources, over which the Navy had previouly exercised full control, has been reduced by environmental and intergovernmental jurisdiction and coordination requirements. Many of the environmental regulations, for example, now require the Navy to consult, work with and/or obtain the consent of other government bodies to effect desired Navy actions (9:2).

The Pinecastle range land target complex offers a nearby example of a current intergovernmental encroachment problem. The Navy has operated the Pinecastle ranges since 1951, in a small section of the Ocala National Forest, with a special use permit from the Forest Service. Recent range safety incidents, coupled with a perceived incompatibility between range operations and the maintenance of a national

forest have resulted in proposals by the Forest Service for termination of Navy operations by 1994 (18:V-3).

Executive Order 12348, signed by President Reagan in 1982, directs the General Services Administration (GSA) to conduct real property utilization surveys of federal property holdings. The thrust of the program is to identify excess federal land for sale to assist in reducing the national debt. The Navy and GSA do not always agree on whether particular land holdings are excess. Although no Naval air stations have been impacted to date, the potential to declare some buffer zone lands (e.g., noise zones) excess is a very real threat.

The fourth category of encroachment centers around legislative encroachment. Legislative encroachment involving Congressional intervention is a growing concern to the Navy. Politically connected interests are channeling their encroachment efforts into the political arena for resolution. This type of encroachment results in legislative law or "report language" which inhibits Navy actions.

An example is a legislative effort, mounted in 1984, to preclude continued Navy ownership of electrical generation and transmission facilities on Guam. The Interior Department's appropriations bill, as originally drafted for the Congress, would have directed the Navy to transfer ownership of the electric power generation and transmission facilities on Guam to the Guam Power Authority (GPA) within one year. A major factor in the Navy's objection to this

transfer stems from GPA's inability to demonstrate sound financial responsibility or operational reliability. At the last minute, the Navy was successful in having the effort downgraded from public law to report language. Hence, the Navy retained ownership thereby assuring continued electrical power support for the Naval air station and the other military facilities on the island (18:III-4).

The fifth and final category of encroachment takes shape when the Navy itself initiates mission or other changes at its shore activities. Mission dynamics and changes in weaponry, for example, at times require major changes in station operational procedures. These changes often elicit concern and adverse reactions from various elements of the surrounding community.

This source of encroachment is particularly applicable to Naval air stations. Introduction of a new type of jet aircraft, for example, can contribute significantly to the noise environment. At NAS Fallon, in Nevada, several changing mission requirements have drawn considerable public attention resulting in numerous congressional inquiries as well as intervention by the Nevada delegation. Basing of a new aircraft, the F/A-18 Hornet, establishment of a strike warfare center, designation of a supersonic operating area and withdrawl of 181,000 acres of public domain land for Navy use has created much adverse reaction. Several lawsuits have been initiated against the Navy to restrict these operations (18:III-4).

The scope and intensity of encroachment related problems dictate the need for prompt resolution. In later chapters, this paper will examine some of the strategies being employed to deal with the encroachment threat.

CHAPTER THREE
LAND USE COMPATIBILITY (LUC) PROGRAM

3.1 Program Overview

The Navy has recognized the encroachment threat for a number of years, but only within the last decade has the problem become an acute one with such dimensions and threatening potential.

In the early seventies, "Project Safeguard" was designed as a reporting system to collect information about specific encroachment threats at Naval shore activities. It was an effective tool to communicate, to higher Navy and DoD authority, the nature and extent of specific problems but fell short in assisting local commands in preventative encroachment planning efforts (19). The Air Installations Compatible Use Zones (AICUZ) program was developed in this same timeframe to be the nucleus for encroachment planning at Naval air stations. This program is discussed in detail during chapter IV.

The limited scope of the AICUZ program and the weaknesses of Project Safeguard soon became apparent to Navy authorities. A more comprehensive program, based on systematic planning criteria and techniques, was needed to address the entire spectrum of encroachment related problems (19).

The Land Use Compatibility (LUC) program emerged, in 1983, as a joint effort between the Navy and Marine Corps to combat encroachment threats thru proactive planning efforts at all levels of the chain of command. The principal thrust of the program is two-fold: First, to maintain mission capability and operational flexibility within the Naval shore establishment and second, to protect the significant capital investment the federal government and taxpayer has made in land and improvements (19).

3.2 Program Elements

The LUC program addresses all five categories of encroachment discussed in chapter two. Five main elements comprise the LUC program (19):

1. Staff support
2. AICUZ program
3. Technical studies
4. Awareness and training
5. Institutionalization

The first element, staff support, provides the basic framework of the program. Under the Chief of Naval Operations (CNO) and SECNAV, the Deputy CNO for Logistics (OP-04) assumes the lead role in managing the LUC program. OP-04, in turn, depends upon the Naval Facilities

Engineering Command (NAVFACENGCOM) to provide the comprehensive planning services to the various local activity commanders. NAVFACENGCOM utilizes its six Engineering Field Divisions (EFD's) to provide the tailored planning services, with in-house and A/E consultants who have expertise in the different encroachment areas (17:2).

The Marine Corps counterpart to the Deputy CNO (Logistics) is the Commandant Marine Corps (CMC) but all USMC shore activities obtain individual planning services from the appropriate EFD.

The staff support network, in addition to providing expert planning services to the field activities, also serves to communicate information and ideas about appropriate encroachment strategies to all levels of the chain of command. Quarterly "Real Property Utilization Review Meetings", for example, are convened with high level Navy and CMC officials to provide a forum for information and status updates about specific encroachment issues. Mobilization of DoD and higher Washington level support is often recommended to mitigate encroachment problems when needed.

The AICUZ program continues to be the mainstay of the Navy's encroachment program for air stations. Although limited to primarily noise and accident issues, the AICUZ program has been extremely effective in prompting local

governments use of land use controls to limit encroaching developments.

The third element of the LUC program is designed to analyze specific encroachment cases and to develop strategies to cope with the problems. Technically oriented encroachment studies may be developed for a single activity or for a region which is experiencing severe encroachment problems.

Another vehicle for providing professional encroachment planning services to local commanding officers and their chain of command is the master plan. Master plans provide overall development policy and guidance to individual shore activities. Recently, Master plans have been modified to assist in combating encroachment problems. "Master planning" is a comprehensive planning process utilized to insure logical and efficient use of facilities and real estate assets and to guide activity growth. All Master plan updates now include information and recommendations concerning existing and potential encroachment problems.

Awareness and training efforts are crucial elements in promoting overall program effectiveness. Various training programs and seminars have been developed, by the Navy, to educate commanding officers and their key staff members on the AICUZ and LUC programs. Alerting responsible individuals to the pervasive and sometimes insidious nature of the

encroachment threat is a continuing but necessary requirement to maintain the vitality of the LUC program.

Finally, the promulgation of tasking for command responsibility regarding the scope, authority and responsibility for commanding officers institutionalizes the program. Commanding officers of shore activities are charged with the responsibility for conducting liason with other government agencies (i.e., federal, state and local) and community groups and for assigning staff to monitor off-base developments as the primary means for combating encroachment. This assertive off-base initiative is a critical aspect of the Navy's LUC program for effective encroachment control planning.

CHAPTER FOUR
AICUZ PROGRAM

4.1 Program Overview

Military air installations, like their civil airport counterparts, often create encroachment problems due to their operational nature. Flight operations are inherently noisy and the potential for aircraft accidents create real hazards for the surrounding community.

Logically, planning efforts are needed to mitigate or deter the hazards presented by the air base. Although the military has been aware of its responsibilities in this arena, for some time, it was not until 1973 that a formal strategy was developed to address the major hazards - noise and aircraft accident potential.

Federal recognition of the problems associated with environmental noise and its harmful effects on humans, in the early 1970's, were primarily responsible for attracting attention to the noise hazards generated by airports (20:4100-1). Passage of the Noise Control Act of 1972 (P.L. 92-574)) and the Occupational Health and Safety Act of 1970 (P.L. 91-596) prompted federal agencies along with state and local governments to develop measures to control the harmful effects of noise on people.

The Air Installations Compatible Use Zone (AICUZ) program was subsequently developed by DoD as the primary strategy to achieve compatibility between military air

installations and their neighboring communities (2:1). Furthermore, it was developed to maintain air base operational capability, while protecting the safety, health and welfare of the public. It is a program which utilizes sophisticated land use planning techniques to mitigate the effects of aircraft noise and accident potential at all designated military airfields.

AICUZ studies provide a comprehensive analysis of aircraft operations and the noise generated as a result of these operations. (i.e., both in-flight and ground operations) Aircraft accident potential zones (APZ's) are also developed based on the air base's mix of aircraft type and aircraft operational data. Military and civilian land use policies are studied to identify areas where incompatible land uses may exist. A program is then developed to achieve land compatibility based on aircraft noise and accident potential data. Three options exist to achieve this compatibility (16:5):

1. Reduction of the aircraft's noise at the source.
2. Modification of flight/ground operations.
3. Isolation of people from noise/accident potential.

Military aircraft manufacturers have attempted to design quieter engines for aircraft but, given their high performance characteristics, little can be done to significantly lower their noise signatures. Of the three options, the latter two offer the best opportunity to

minimize adverse noise and safety aspects (16:6). The AICUZ program recognizes that a major emphasis must be placed on rational land use determinations within and adjacent to the military air field.

The Navy, in particular, has used the AICUZ concept with considerable success since its inception in 1973. AICUZ planning documents have been generated for all 76 Navy/Marine Corps air stations and have been effectively utilized to guide land use actions both on and off the station (19). While the Navy has no authority to control land use off station, it does have the responsibility as a land owner to advise local government on land use compatibility issues related to the AICUZ. The Navy supports local government when, in response to AICUZ planning information, it exercises its police powers (e.g., zoning , building codes, etc.) to preclude incompatible development (2:34).

The AICUZ concept embodies a systematic method of defining, quantifying and mapping aircraft noise, accident potential zones and existing or potential incompatible land uses, both on and off the air station. Implementation of the Navy's AICUZ program involves three basic steps (2:2):

1. Preparation of studies to develop a program of optimum noise pollution reduction. Subsequently, a compatible land use plan for the station is developed, based on the quantified noise and accident potential configurations. Strategies are then developed to ensure

compatible development of lands within the areas of interest.

2. Development of a time-phased implementation program including a plan for coordination with federal, state and local officials. A program is also developed to enhance public awareness of the AICUZ program.

3. Identification and programming of recommended property rights acquisition and noise abatement projects in situations where action to achieve compatibility within the AICUZ through local land use controls has been attempted but failed.

The three basic steps are not mutually exclusive of one another. Rather, there is significant interaction among the steps and in practice, they are developed concurrently. It's worth noting that the scale of the planning effort should be proportional to the existing or potential compatibility problems of the individual air station-environs situation.

Subsequent to the initial implementation effort, an important "fourth step" can be considered to exist. Providing for the monitoring and periodic review of the AICUZ plan is critical to the entire planning effort. Urban areas, in particular, are in a continual state of change. Population growth and commercial/industrial developments generate continuous pressure against zoning and other land use controls established to achieve and protect compatibility. Therefore, a continual review and feedback

process must exist to monitor the compatibility and implementation plan.

4.2 LEGAL ASPECTS

The AICUZ program has generated many legal questions regarding the governments' use of airspace over and adjacent to private property. The law, as it relates to AICUZ, is reasonably well defined with a substantial background of case law (5:1)

Under the Federal Aviation Act of 1958 (P.L. 85-726), the Congress has declared the sovereignty of the United States over the air space:

> "The United States of America is declared to possess and exercise complete and exclusive National sovereignty in the airspace of the United States".....(12:7b)

By this action, the federal government has preempted regulation of the airspace by state or local aurhorities. Under the Noise Control Act, the Congress established aircraft noise standards but these regulations only applied to civil not military aircraft (12:7b). Historically, military aircraft have been exempted from many federal regulations. As a result of these exemptions, as well as the special performance requirements of military aircraft (e.g., noiser aircraft) the problem of the impact of aircraft operations on adjacent private landowners can be magnified (5:3).

The military does not avoid all federal direction with regard to aircraft noise or safety. Under the federal program section of the Noise Control Act and the mandated AICUZ program, the military has been directed to examine the impact of its operations in specific regards to the surrounding environment (5:3). In addition, under the OHSA Act, all federal agencies are required to establish programs to maintain a safe and healthful workplace (5:4). Thus, the military must take steps to reduce the noise impact on the federal worker. This is particularly applicable to military installations where workers are exposed to not only the noise eminating from aircraft flight operations but from the various ground maintenance activities as well. (e.g., jet engine ground tests)

The potential for legal actions, against the military, arising from air field operations can originate primarily from three sources (5:5):

1. Inverse condemnation-physical intrusion
2. Inverse condemnation-non physical intrusion
3. Federal tort claims

Inverse condemnation relates to the right of a private landowner to force the government to pay just compensation if his property has been taken without payment or compensation. Under the fifth amendment to the U.S Constitution, private property shall not be taken for public use without just compensation. Inverse condemnation

lawsuits, relating to the federal government, are brought under the Tucker Act. Physical intrusion situations arise when aircraft "take" private property as a result of direct lowflying overflights. The Supreme Court of the United States has defined such a taking in the following manner:

> "Flights over private land do not amount to a taking unless they are so low and frequent as to be a direct and immediate interference with the enjoyment and use of the land." (5:7)

Note that the element of noise is not included in a physical intrusion.

Non physical intrusion cases embody the taking of private property for other factors such as zoning restrictions and building/housing codes. Landowners who are restricted from developing their land in a particular fashion due to adverse zoning, for instance, use this basis for a lawsuit.

Finally, the category of Federal tort claims can be used as a basis for legal actions. It is a well established legal principle that suit can be brought against the United States only as allowed by the sovereign. Congress grants this waiver of sovereign immunity thru the Federal Tort Claims Act. Under the terms of this Act, recovery for noise is based on a nuisance theory where it must be shown that the noise was generated in a negligent or wrongful manner thereby incurring a government liability (5:15).

The AICUZ program has withstood the rigors of considerable litigation since its inception. To gain an insight into how litigation arises, it is important to note how the program establishes and concludes land uses which are compatible. The cornerstone of DoD's policy is to work toward a compatible land use plan by means of a compatible land use planning and control process conducted primarily by the local community (5:18). The AICUZ study, for a given air installation, identifies noise and accident potential concerns. Access to these studies, by the public along with state and local officials, is a key element under the AICUZ program. By permitting full disclosure, it is felt that certain land use objectives can be obtained through public pressures and actions with regard to an awareness of the impact on airbase operations. A possible disadvantage to this full disclosure aspect, however, relates to the private landowner who is using his land in an incompatible fashion (e.g., Operating a day care center in a high noise or accident potential zone.) knowing that the AICUZ plan considers it an incompatible land use. In this situation, a constitutional taking might be alleged. As of the present, no litigation cases have been found where there has been a finding that a taking occurred based on this alleged documentary admission of adverse impact (5:19). Other litigation cases, relating to allegations of a taking have been reviewed by the courts; however, no decisions against the government have been made (5:19).

Clearly, the AICUZ program can be subjected to attack from a variety of sources and legal aspects. It is to the program's credit that case law has substantiated AICUZ as a reasonable and responsible approach to land use planning around air installations. AICUZ strives to achieve compatible land use planning within the framework of local government and it is accomplished in a sincere and open manner with the full availability of all material relating to the program.

4.3 Noise

The first step in establishing compatible land uses, under the AICUZ concept, is to define and map the noise environment. Accurate development of this information will have a profound impact on the overall quality of the AICUZ plan and hence on its use as a planning tool (2:3). Understanding some of the problems and aspects of noise pollution provide important insights on how aviation operations affect the surrounding community.

The control of noise pollution is one of our most complex environmental problems. This stems from the fact that, unlike other forms of pollution, (e.g., air and water) noise pollution is dependent upon human perception and response.

Standards for environmental noise control have been difficult to establish due to the subjective nature of noise

and the resultant variety of methods for noise measurement. Research efforts have attempted to quantify perceptions of sound and human response to environmental noise . A large volume of literature exists relating to the impact of noise on people but much research remains to be done.

4.3.1 Noise Science

Certain terms must be defined before discussing how people perceive and react to noise, how its measured and described. Noise can be defined simply as "unwanted sound which produces unwanted effects." (13:2)

The human ear is extremely sensitive to a wide range of sound pressures. An average human ear is sensitive enough to detect a sound pressure as low as 20 micropascals (μP) and it can tolerate sound pressure as high as 200,000 μP. To reduce the range of numbers that represents sound energy, a logarithmic ratio is used. The term level is the logarithmic value of the ratio of a sound pressure quantity relative to a reference quantity (13:3). Figure 1 illustrates the relation between sound pressure and sound pressure level also called intensity.

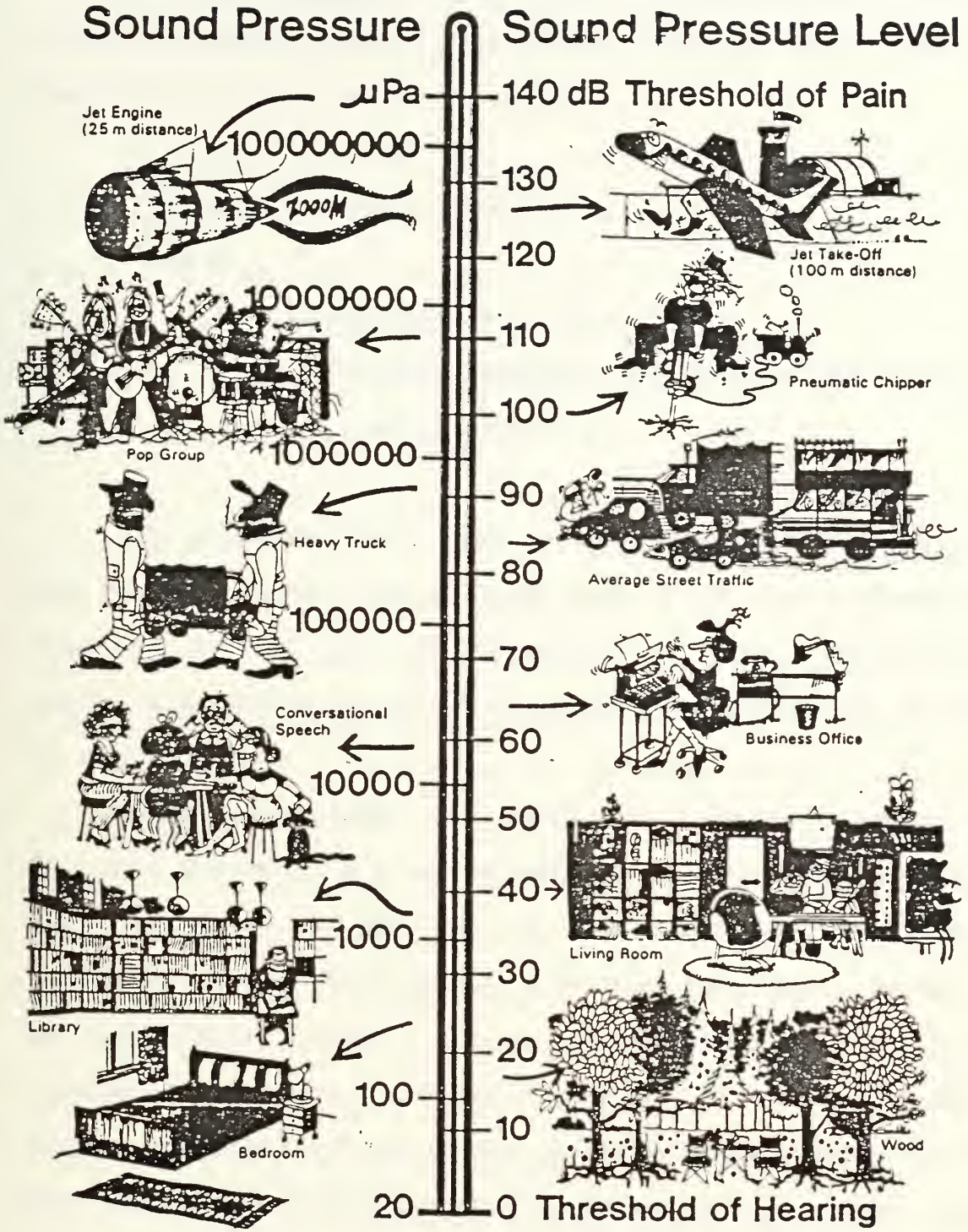


FIGURE 1

SOUND PRESSURE RELATIONSHIPS

Source: (20:4120-1)

The term decibel is the unit of measurement of sound levels. Mathematically, the sound pressure level (SPL) or decibel is expressed as (15:575):

$$dB = SPL = 20 \log (P/P_o)$$

Where .....

P = sound pressure, (μP)

P_o = reference pressure, 20 Newtons per square meter (N/m^2)

By using decibels, the large range of sound pressures can be compressed into a range from 0 dB, the threshold of hearing, to 140 dB, the threshold of pain. Using the dB scale, a doubling of sound level is represented by a change of about 3 dB.

Human perception of noise is dependent upon many factors. However, one can summarize very simply by stating that "noise is in the ear of the beholder". Each person perceives noise differently, People can hear sounds of varying levels over a broad range, but are relatively insensitive to small changes. Loudness is the term used to relate human perception to the sound intensity level (13:4). The perceived loudness or noisiness, of a given sound, depends on several measurable physical characteristics. These factors include (13:5):

1. Frequency of noise
2. Duration of noise

3. Time of day

4. Noise levels (intensity)

The frequency or pitch of sound is an extremely important factor in the evaluation of noise. A source of sound normally generates a range of frequencies. Higher frequency noises, particularly those between 2,000 Hz to 8,000 Hz, are perceived to be louder than low frequency sounds of equal sound pressure levels.

Another factor which relates to perceived loudness is the duration of the noise. As duration increases, people tend to perceive greater loudness.

The time of day also impacts on human perception. Noise is considered more disturbing at night than during the day.

Finally, the intensity of the noise itself determines how disturbing it is. At a constant frequency, sounds are perceived to be louder as the sound level increases. (e.g., 1,000 Hz at 50 dB vs 60 dB) In addition, fluctuation of sound levels and frequencies over short periods of time tend to be more disturbing to the listener. Curiously, researchers have found that a difference of about 10 dB is required before a person perceives a doubling of loudness (8:3). This is an important concept to remember. While a 10 dB change corresponds to a factor of two in subjective loudness, a 3 dB change corresponds to a factor of two in sound energy.

A number of more subjective physical factors have also been identified as influencing the way in which a person may react to the noise. These other factors include (8:5):

1. Type of neighborhood
2. Season
3. Predictability of the noise
4. Control over the noise source
5. Environmental factors (e.g., over water or land)

4.3.2 Measurement and Description of Noise

Noise can be objectively measured with a variety of specialized instruments. The most common instrument, the sound-level meter, measures the intensity of ambient noise in terms of decibels. However, to measure the subjective aspects of noise requires the use of a correlation scale. Researchers have developed such a scale which incorporates the effects of frequency on sound perception. This scale, known as the A-weighted scale, has proven to correlate reasonably well with community perceptions and is used in all AICUZ noise surveys (13:7).

In the study of community response to aircraft noise, the total noise environment must be considered. Research has shown that effects of noise on people is a function of the cumulative influence on numerous noise events occurring during a day. Cumulative measures of noise exposure, known

as noise descriptors, have been developed to quantify and describe the noise events occurring during the day (15:557).

There are a variety of noise descriptors in use today. However, current AICUZ noise surveys only use two types (13:10):

1. Day-night Average Sound Level (Ldn)
2. Community Noise Equivalent Level (CNEL)

Ldn is the methodology used in all AICUZ surveys except in the State of California which uses CNEL. Ldn and CNEL are conceptually identical and use the same basis for measuring noise. (i.e., A-weighted scale) Both describe 24 hour average sound levels and both use altitude levels, aircraft power levels, airspeed and noise levels from each aircraft type. The only difference arises from CNEL dividing the day into three, eight hour periods, while Ldn divides the day into one, 15 hour period and one 9 hour period. The mathematical expression for the Ldn noise descriptor is depicted below (15:585):

$$Ldn_{ij} = NEL_i + 10 \text{ Log } (Nday + 10 \, Nnight) - 49.4$$

where .....

Ldn = Day-night average noise level, dB(A)

NEL_i = Single flyover noise level of an aircraft i on flight path j, dB(A)

Nday = Total number of operations between 0701 and 2200

Nnight = Total number of operations between 2201 and 0700

The Ldn/CNEL methods produce noise zone contours which map the noise footprint for an air station. The contours synthesize the aircraft noise impact over time into a single measure for each location. The noise areas are divided into three zones. Noise zone 3 is the most severely impacted while zone 1 is the least impacted. Figure 2 displays the Ldn and CNEL noise descriptor values for each zone.

The development of an AICUZ noise survey is a two step process involving on-site noise measurements and a computer generated set of noise contours. The purpose of the on-site measurements is to verify the computer program results and to check for sensitive areas or unusual operating conditions. Noise measurements do not have to be taken to develop a noise footprint for the activity.

The data requirements to develop an accurate noise survey are summarized in Table 1. The Navy uses this raw data for input in the computer "NOISEMAP" model (13:12).

4.4 Accident Potential

The second focus area, embraced by the AICUZ program, relates to the measurement of aircraft accident potential. The incidence of aircraft accidents during the takeoff/departure and approach/landing phases of flight

NOISE DESCRIPTORS	NOISE ZONES		
	LOWEST		HIGHEST
	1	2	3
Ldn (Db-A)	< 65	65-75	> 75
CNEL (Db-A)	< 65	65-75	> 75

SOURCE: (2:16)

FIGURE 2

NOISE DESCRIPTOR COMPARISON CHART

TABLE 1

NOISE CONTOUR DATA REQUIREMENTS[1]

AIRFIELD OPERATIONS

1. Operations
   a. Annual (1-3 years)
   b. Monthly (last year)
   c. Daily (time of day)
2. Runways
   a. Location
   b. Length
   c. Utilization
3. Runup Pads
   a. Location
   b. Orientation
   c. Aircraft/Engine type
   d. Number of runs
   e. Duration
   f. Time of day

AIRCRAFT

1. Types
2. Base loading
3. % of operations by type
4. Mission profile
   a. Departures
   b. Arrivals
   c. Touch and go
   d. FCLP[2]
5. Flight tracks
   a. Location
6. Altitude profiles
   a. Altitude
   b. Power setting
   c. Airspeed

SOURCE: (20:4120-1)

FOOTNOTES

1. The above listed data elements are obtained by interviews with operations staff, squadron pilots and by on-site observation. The NOISEMAP computer program generates a noise footprint based on a "model" day. That is, the program considers all operations on all runways during the year.

2. FCLP - Field Carrier Landing Practice

account for the majority of all aircraft in-flight accidents. The air installation and the immediate adjacent lands represent areas which statistically will see a much higher accident rate than other areas. Clearly, identification of areas which can be measurably evaluated as high risk potential should remain undeveloped or, if developed, should only be sparsely developed to preclude the adverse effects of a possible aircraft accident.

The accident potential concept is not directly based on crash probability but rather on the acceptability of land uses assuming that a crash did occur in an area having a measurable potential for aircraft accidents (2:10). The keyword here is measurable.

The AICUZ program makes use of a methodology, developed by the U.S. Air Force, which is designed to measure the cumulative percentage of accidents contained within areas of specified length and width. The method is used to define accident potential zones (APZ's) and clear zones which exhibit the maximum percentage concentration of accidents in the smallest area.

The data required to support the accident potential analysis is historically oriented, but it remains valid since it reflects specific performance characteristics of the aircraft using the air installation.

The location, size and shape of the APZ is determined by (4:19):

1. Analysis of specific aircraft types, operating parameters and flight conditions at the activity.

2. Application of DoD guidelines developed from a comprehensive analysis of accident histories over many years.

3. Analysis of past aircraft accidents at the activity.

The Navy has set forth the guidelines for determining APZ's for fixed wing aircraft in the following manner:

1. Clear Zone - Designation of a clear zone is required for all active runways. This zone historically possesses the hightest potential for accidents and is normally owned by the government in fee simple.

2. APZ I - This zone is normally designated at airfields which experience 5,000 or more annual operations. An operation is defined in the following manner:

a. Each takeoff and landing is counted as one operation.

b. Each touch and go and FCLP is counted as two operations. APZ I's are typically rectangular in shape but can be curvelinear to follow the principal approach and departure flight tracks.

3. APZ II - APZ II zones are defined as the area extending beyond the APZ I, or clear zone if the APZ I is not used, to 15,000 ft from the runway end. Like the APZ I, it can be modified to follow principal flight tracks. Although normally used in conjunction with the APZ I, it can be used singularly if an analysis of accidents and

operations indicates a need for it. (e.g., An airfield with less than 5,000 annual operations which flies aircraft posessing unusually high accident rates, such as training aircraft.)

APZ's and clear zones for helicopter aircraft are quite different from the fixed wing variety. They are considerably smaller in size and normally do not pose land use planning problems. The primary focus of this discussion therefore will center on fixed wing aircraft APZ's. Figure 3 illustrates the geometry of a typical APZ configuration.

Under certain conditions, APZ's can be modified to suit local aircraft characteristics and operational considerations. The impact of aircraft crashes and the predictability of the crash location itself are dependent upon many factors including aircraft type, the specific problem which caused the crash, etc. Therefore, deviations from the normal APZ may be dictated. The following items constitute possible parameters for establishing modifications to the APZ (4:20).

1. Reliability of the aircraft.
2. Missions, tasks and functions assigned to the air station
3. Type of aircraft operations.
4. Frequency of operations.
5. Prevalent weather conditions.

FIGURE 3

RUNWAY CLASSIFICATION BY AIRCRAFT TYPE[1]

CLASS "A" RUNWAYS

C-1	O-2	
C-2	OV-1	
C-4	OV-10	
C-6	S-2	
C-7	T-28	
C-12	T-34	
C-45	T-41	
C-47	T-42	
C-117	T-44	
E-1	U-10	
E-2	U-11	
O-1	U-21	
	UV-18	

CLASS "B" RUNWAYS

A-3	C-123	F-100
A-4	C-130	F-101
A-5	C-131	F-104
A-6	C-135	F-105
A-7	C-137	F-106
A-8	C-140	F-111
A-10	C-141	P-2
A-18	E-3	P-3
B-1	E-4	S-3
B-52	F-4	R-71
B-57	F-5	T-2
C-2	F-8	T-29
C-9	F-14	T-33
C-14	F-15	T-37
C-15	F-16	T-38
C-118	F-17	T-39
C-121	F-18	U-2

[1]Only symbols for basic mission aircraft or basic mission aircraft plus type are used. Designations represent entire series. Runway classes in this table are not related to aircraft approach categories or to pavement design classes or types.

FIGURE 3 - CONTINUED

ACCIDENT POTENTIAL ZONES[1][2]

(FIXED WING AIRCRAFT)

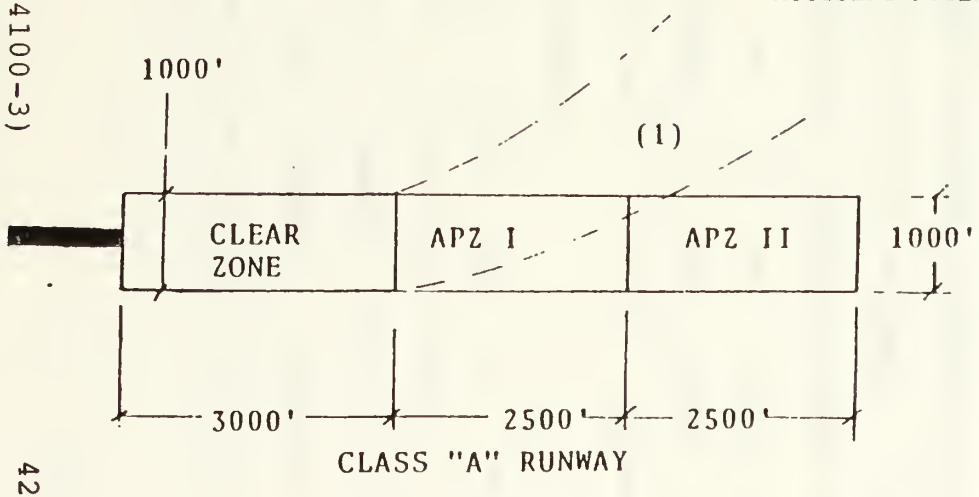
CLASS OF[3] RUNWAY	CLEAR ZONE LENGTH (FT)	CLEAR ZONE WIDTH (FT)	APZ-I LENGTH (FT)	APZ-I WIDTH (FT)	APZ-II LENGTH (FT)	APZ-II WIDTH (FT)
CLASS "A"	3000	[4] 1000	2500	1000	2500	1000
CLASS "B"	3000	[5] Width of approach/departure fan	5000	3000	7000	3000

(1) Sizes shown are normal dimension. Their use shall be verified at each installation (either confirmed or justification for their modification provided in accordance with paragraph C.(3).
(2) See following page for sketch of fixed wing aircraft APZ's.
(3) See paragraph C.(1)(b) for definition of Class "A" and "B" runways.
(4) Class "A" runway is most likely to occur at basic training propeller aircraft OLF's.
(5) Fan referred to is standard Navy fan (see NAVFAC P-80)

SOURCE: (2:4100-3)

FIGURE 3 - CONTINUED

FIXED WING AIRCRAFT
ACCIDENT POTENTIAL ZONES

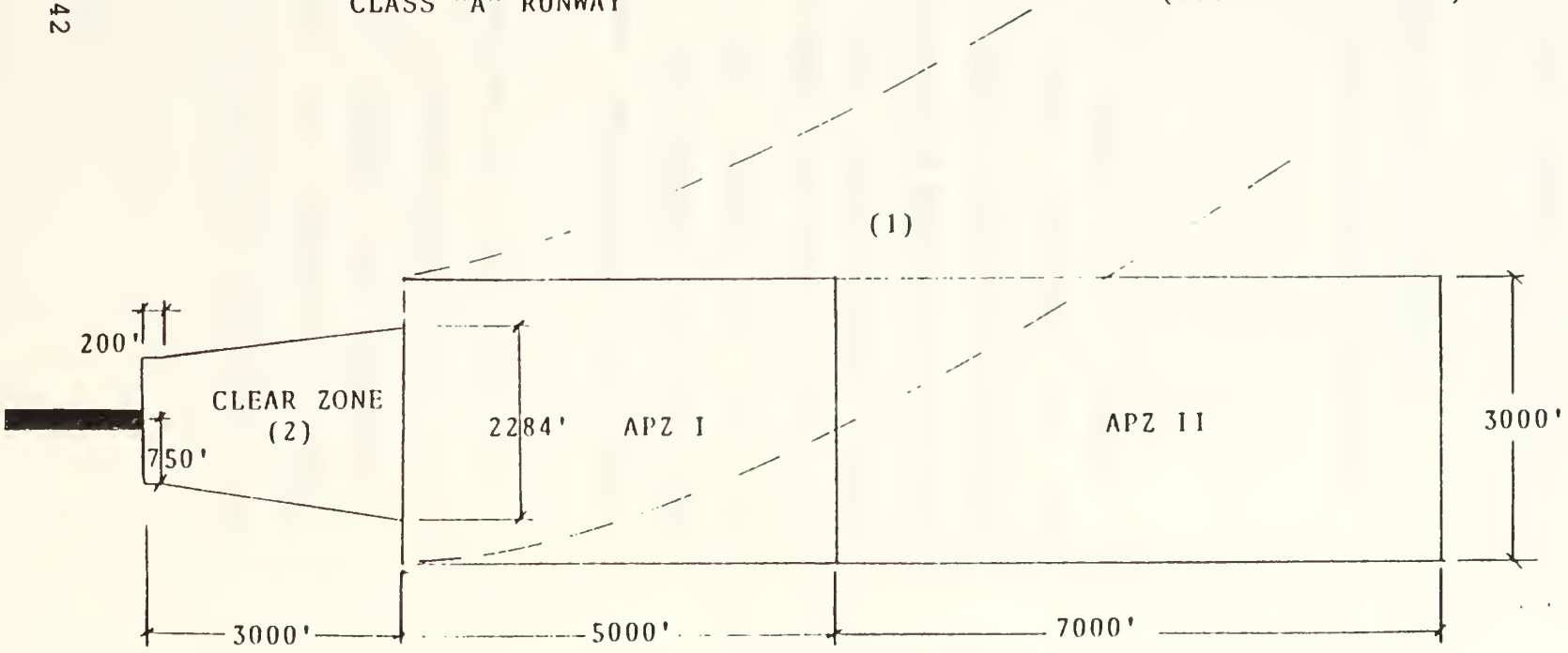


CLASS "A" RUNWAY

NOTES:

(1) APZ I and II may be altered to conform with flight shadow.

(2) The width is the same as the Navy standard 50:1 approach/departure fan. (See NAVFAC P-80.)



CLASS "B" RUNWAY

6. Prevalent flight mode (IFR/VFR)
7. Physical characteristics of the runway/runway end (length, slope, etc.).
8. Topography surrounding the installation (affecting flights).
9. Approach/departure flight paths/restraints.
10. Population density (current/projected ten years).

4.5 Land Use Compatibility

At the core of the AICUZ program is a matrix of recommended compatible land uses developed for the individual installation. This matrix outlines recommended land uses for areas impacted by varying degrees of noise and accident potential exposure. These recommendations provide for the highest and best compatible land use to assure that people, as well as incompatible operations, are not concentrated in areas which are exposed to high noise pollution and/or aircraft accident potential. (i.e., both on and off base.)

The "AICUZ area" is defined as the area for a particular installation where it is determined that land use controls are needed. This area includes land impacted by noise and accident potential. In overlaying graphic representations of the noise and accident potential, nine

combinations of noise and accident potential are possible (2:9). Compatible land uses for each of the nine zones which occur will then be presented in the land use matrix.

Figure 4 illustrates the compatibility matrix for noise. Noise levels in the matrix are presented in seven bands which are directly related to the three noise zones used on the AICUZ maps. (i.e., zones 1,2 and 3)

There are three basic categories of land use acceptability contained within the matrix: (1) Compatible, (2) Restricted and (3) Incompatible.

COMPATIBLE: The noise exposure is such that the activities associated with the land use may be carried out with essentially no interference from aircraft noise. In residential areas, both indoor and outdoor noise environments are pleasant.

RESTRICTED: The compatibility of the proposed land use to noise is dependent upon satistaction of specific restrictive criteria such as acoustic insulation, building location and site planning.

INCOMPATIBLE: The noise exposure at the site is so severe that construction costs to make the indoor environment acceptable for performance of activities are significantly greater. In residential areas, the outdoor

LAND USE COMPATIBILITY IN NOISE AREAS

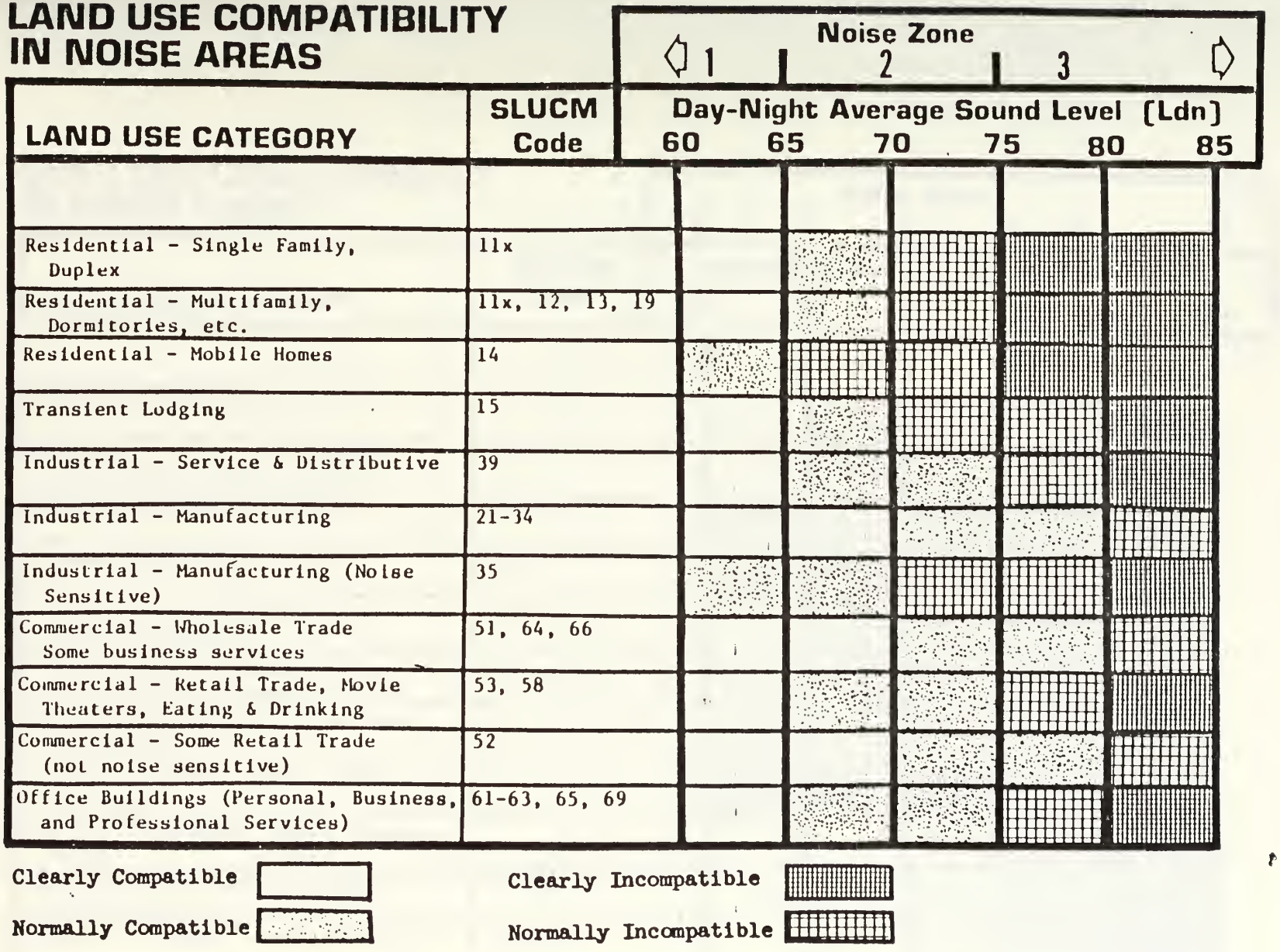


FIGURE 4

LAND USE COMPATIBILITY IN NOISE AREAS

LAND USE CATEGORY	SLUCM Code	Noise Zone 1 / 2 / 3 — Day-Night Average Sound Level (Ldn): 60	65	70	75	80	85
Classrooms, Libraries, Churches	68, 711						
Hospitals, Medical Facilities, Nursing Homes (24hr occupancy)	651						
Auditoriums, Concert Halls	721						
Outdoor Music Shells	721						
Outdoor Sports Arenas, Outdoor Spectator Sports	722						
Playgrounds, Neighborhood Parks, Active Sport Recreational Areas	761, 762						
Golf Courses, Riding Stables, Water Recreation	741x, 743, 744						
Outdoor - Frequent Speech Communication							
Outdoor - Infrequent Speech Communication							
Agricultural (except livestock), Mining, Fishing	81-85						
Livestock Farming, Animal Breeding	815-817						

Clearly Compatible

Normally Compatible

Clearly Incompatible

Normally Incompatible

FIGURE 4 - continued

NOTES FOR MATRIX ON
LAND USE COMPATIBILITY IN
NOISE AREAS

1. CLEARLY COMPATIBLE: The noise exposure is such that the activities associated with the land use may be carried out with essentially no interference from aircraft noise. (Residential areas: both indoor and outdoor noise environments are pleasant.)

2. NORMALLY COMPATIBLE: The noise exposure is great enough to be of some concern, but common building construction will make the indoor environment acceptable, even for sleeping quarters. (Residential areas: the outdoor environment will be reasonably pleasant for recreation and play.)

3. NORMALLY INCOMPATIBLE: The noise exposure is significantly more severe so that special building construction is often necessary to minimize adverse impacts on people and reduce interference with performance of normal activities. (Residential areas: barriers are sometimes erected between the site and prominent noise sources to improve the outdoor environment; sound attentuation is recommended in some buildings.)

4. CLEARLY INCOMPATIBLE: The noise exposure at the site is so severe that construction costs to make the indoor environment acceptable for performance of activities is significantly more expensive. (Residential areas: the outdoor environment would be significantly impacted for normal residential use.)

5. SLUCM: Standard Land Use Coding Manual. "x" represents SLUCM category broader or narrower than, but generally inclusive of, the category described.

6. The compatibility matrix has been determined by a number of noise sensitivity factors including: speech communication needs; subjective judgements of noise compatibility and relative noisiness; need for freedom from noise intrusions; sleep sensitivity criteria; accumulated case histories of noise complaint experience; and typical noise insulation provided by common types of building construction.

7. For many land uses, higher levels of exterior noise exposure may be acceptable provided there is a proper degree of building noise insulation. Such tradeoffs are possible for land uses where indoor activities predominate.

SOURCE: (2:14)

FIGURE 4 - continued

environment would be significantly affected for normal residential use.

Figure 5 illustrates the compatibility matrix for differing levels of accident potential. Again, three categories within this matrix are defined:

COMPATIBLE: Exposure to accident potential is such that the activities associated with the land use may be carried ou with essentially no interference or substantial loss of life and property.

RESTRICTED: The compatibility of the proposed development to accident potential is dependent upon satisfaction of specific restrictive criteria such as density controls.

INCOMPATIBLE: The exposure to accident potential at the site is so severe, due to potential loss of life and property, that performance of land use activities is not advisable.

Interpretation of both matrix arrays is straight forward and the evaluator can clearly assess existing or planned land uses in terms of specific compatibility with the noise level or accident potential generated by the aviation operations. For any specific parcel of land or

LAND USE CATEGORY	COMPATIBILITY[1]		
DENTIAL	Clr.Zone	APZ-I	APZ-II
le family .			2
family			
i-family dwellings			
p quarters			
dential hotels; transient lodging (motels, etc)			
le home parks or courts			
r residential			2
STRIAL/MANUFACTURING[3]			
and kindred products			
ile mill products			
rel			
er and wood products			
iture and fixtures			
r and allied products			
ting, publishing			
icals and allied products			
oleum refining and related ind.			
er and misc. plastic products			
e, clay, and glass products			
ary metal industries			
icated metal products			
., scientific & controlling instr.			
. manufacturing			
SPORTATION, COMMUNICATIONS & UTILITIES			
road, rapid rail transit (on-grade)	5	4	
way and street right-of-way	5		
parking (Long-term)	5		
unication	5	4	
ities	5	4	
r trans., commun. and utilities	5	4	
ERCIAL/RETAIL TRADE			
esale trade			
ding materials-retail			
al merchandise-retail			
retail			
otive, marine, aviation-retail			
el and accessories-retail			
ture, homefurnishing-retail			
g and drinking places			
retail trade			

LAND USE COMPATIBILITY IN ACCIDENT POTENTIAL ZONES

FIGURE 5

LAND USE CATEGORY	COMPATIBILITY[1]		
PERSONAL AND BUSINESS SERVICES[6]	Clr.Zone	APZ-I	APZ-II
Finance, insurance and real estate			
Personal services			
Business services			
Repair services			
Professional services			
Contract construction services			
Indoor recreation services			
Other services			
PUBLIC AND QUASI-PUBLIC SERVICES			
Government services			6
Educational services			
Cultural activities			
Medical and other health services			
Cemeteries		7	7
Non-profit organization, incl. churches			
Other public and quasi-public services			
OUTDOOR RECREATION			
Playgrounds, neighborhood parks			
Community and regional parks		8	8
Nature exhibits			
Spectator sports, incl. arenas			
Golf courses,[9] riding stables[10]			
Water-based recreational areas			
Resort and group camps			
Entertainment assembly			
Other outdoor recreation		8	
RESOURCE PRODUCTION, EXTRACTION AND OPEN LAND			
Agriculture (except livestock)			
Livestock farming, animal breeding			
Forestry activities	5		
Fishing activities and related services			
Mining activities		3	
Permanent open space			
Water areas[8]			

FIGURE 5 - continued

learly
mpatible | Normally Compatible | Normally Incompatible | Clearly Incompatible

EARLY COMPATIBLE: Exposure to accident potential is such that the activities associated with the land use may be carried out with essentially no interference or substantial loss of life and property.

RMALLY COMPATIBLE: Exposure to accident potential is great enough to be of some concern, but density of people and structures, when properly planned, will allow the accident potential environment to be acceptable.

RMALLY INCOMPATIBLE: The exposure to accident potential is significantly more severe so that unusual density restrictions are necessary for safety of life and property.

EARLY INCOMPATIBLE: The exposure to accident potential at the site is so severe, due to potential loss of life and property, that performance of land use activities is not advisable.

FOOTNOTES

. Within each land use category, uses exist where further defi-
ition may be needed due to the variation of densities in people
d structures.

. Suggested maximum density 1-2 dwelling units per acre, possibly
creased under a Planned Unit Development (PUD) where maximum lot
verage is less than 20%.

. Factors to be considered: labor intensity, structural coverage,
plosive characteristics, air pollution.

. No passenger terminals and no major above-ground transmission
nes in APZ-1.

. The placing of structures, buildings or above-ground utility
nes in the clear zone is subject to severe restrictions. In a
jority of the clear zones, these items are prohibited. See
FAC P-80 for specific guidance.

FIGURE 5 - continued

6. Low-intensity office uses only. Meeting places, auditoriums, etc., not recommended.

7. Excludes chapels.

8. Facilities must be low intensity.

9. Clubhouse not recommended.

10. Concentrated rings with large classes not recommended.

SOURCE: (2:24)

FIGURE 5 - continued

proposed development, land use planning criteria for noise and accident potential can be determined by application of the information in Figures 4 and 5 to the geographic location in question. The more stringent of the two planning criteria controls the acceptability of potential uses for that location.

If, as a result of this analysis, conflicts are identified, various noise abatement measures can be examined to reconfigure the AICUZ area. Such things as modifications of flight tracks, hours of operations, construction of acoustical enclosures, etc. can affect the extent and configuration of the impact areas.

After considering the various operational alternatives, the AICUZ plan is prepared in rough draft form and submitted for review at various levels of command. Simultaneously, under the provisions of Executive Order 12372, "Intergovernmental Review of Federal Programs", local government bodies are requested to review and provide comments to the Navy on the proposed AICUZ plan. Subsequently, comments/revisions are incorporated into the plan and the Chief of Naval Operations or Commandant of the Marine Corps, as appropriate, approves the document. The approved AICUZ plan provides the necessary guidance for all land use planning on the base until such time that it is superceded by a revision.

In the context of off base utilization, the AICUZ plan is provided to local government to guide their land use

planning efforts. Navy coordination efforts at this point are crucial to the effectiveness of the AICUZ's plan ability to mitigate encroachment problems. Local legislators must enact appropriate land use controls, within the AICUZ, to ensure that citizens are not exposed to unsafe levels of noise or accident potential. It is not DoD or Navy policy to develop positions on what constitutes acceptable land uses off federal property since acceptability is most often based upon factors which are much broader than just noise or accident potential. Therefore, the Navy's land use recommendations are only made in terms of what is not acceptable with regard to noise and accident potential. It is by this means that the AICUZ program can achieve the desired land use objectives in areas surrounding the installation.

CHAPTER FIVE
AICUZ IMPLEMENTATION STRATEGIES

5.1 Basic Strategies

The main focus of the AICUZ program is to achieve compatible land use between the individual air installation and the surrounding communities through a variety of land use controls and noise abatement measures. At each Navy and Marine Corps air station, designated by the CNO or CMC, a detailed analysis of land use compatibility problems and potential solutions are developed and kept current. Table 2 outlines the contents of these AICUZ studies.

Implementation strategies are developed using a combination of actions relating to controlling noise and land use/development. The applicability of the various strategies is, to some extent, dependent upon legislation within individual states or local government and upon each unique air station and environs situation. These strategies will be discussed in the following sections.

5.1.1 Noise Control

Assurance that aircraft noise will be contained within designated noise impact areas is a necessary, but often elusive, aspect of achieving compatibility. Without the assurance of fixing where noise will impact land use, the

TABLE 2

AICUZ STUDY CONTENTS

At each Navy and Marine Corps installation designated by the Chief of Naval Operations or the Commandant of the Marine Corps, a detailed analysis of land use compatibility problems and potential solutions will be developed and kept current. Such analyses, known as AICUZ studies, will include, as a minimum:

(1) Flight operations and tracks;

(2) Noise contours based upon best available documented information on flight operations and aircraft types;

(3) Accident analysis and accident potential zones (APZ);

(4) Desirable restrictions on land use due to noise characteristics and safety of flight;

(5) Analysis of operational alternatives considered in an attempt to reduce noise and/or APZ and those approved for implementation;

(6) Identification of present incompatible uses (on and off station), location and number of noise complaints;

(7) Identification of land that, if inappropriately developed, would be incompatible;

(8) Types of compatible development for various land tracts;

(9) Review of the installation's master plan to ensure that existing and future facility sitings are consistent with the land use compatibility guidelines outlined hereinbefore;

(10) Consideration of joint military/civilian use of the air installation if there is mutual benefit to be received and if such use will result in no loss of mission capabilities and no attendant increase of noise, real estate requirements or construction requirements;

(11) The best available projection of the air operation saturation element/capacity limitation (based upon such things as runway capacity, local airspace congestion, environmental or physical constraints on operations, night operations, etc.). The potential noise and APZ impact that would result from operations at that capacity should also be described. (It is noted that capacity

projections must result from clearly definable mission-related factors and are to be based upon recommendations of the type commander or major claimant, and are to be approved in concept by CNO or CMC prior to incorporation in the study.)

(12) Recommendations for zoning changes, minimum programs of acquisition, relocations, or such other actions as appropriate;

(13) AICUZ map and land use compatibility matrix for the installation;

(14) Description of land use controls currently in effect in the area surrounding the installation;

(15) Environmental impact assessment.

Source: (2:30)

stability of compatibility planning is seriously jeopardized (1:23). The restricting of noise impacts to known areas is largely influenced by air base development actions, aircraft operational and air traffic control procedures. Coupled with the consideration of noise confinement is safety of operation, aircraft operational efficiency and mission requirements. The need to examine these considerations, as they relate to implementation strategy, is of great importance.

The Navy exerts considerable control over aircraft operational procedures and air station developments. Insuring that aircraft conform, for example, to preferential runways, along preferential approach and departure flight tracks, etc. contribute to the abatement of noise pollution. Table 3 illustrates various air operation change considerations.

Air station developments can also be planned and executed to influence where noise impacts will occur. Proper alignment of new runways, blast deflectors, access roads, jet engine test cells, etc. are examples of developments which can be planned with specified noise criteria.

5.1.2 Land Use/Development Controls

Land use and development controls can be used to protect the noise and accident potential impact areas

TABLE 3

AIR OPERATIONS CHANGE CONSIDERATION

SHOPPING LIST OF OPERATIONAL CHANGES TO MITIGATE OR RELOCATE NOISE IMPACT

This list contains operational changes that have been proposed in previous AICUZ studies. In considering operational changes, each proposal must be carefully analyzed as it bears on the activity's mission, standard operating procedures, aviation safety, noise reduction, environmental conditions, airspace characteristics and operational costs.

1. Increase in altitude of FCLP/GCA[1] pattern to decrease width of noise exposure footprint.
2. Increase in glide slope to shorten noise exposure footprint at runaway ends.
3. Relocation of selected operations to other, less noise sensitive fields within the same geographic area.
4. Reallocation of selected operations to alternate runways.
5. Restriction is use of afterburner to areas within station boundary or below 500' AGL[2], whichever is reached first.
6. Implementation of standard departure corridors to require longer straight ahead climbs before commencing turns.
7. Displacement of runway thresholds to shorten noise exposure footprint at runway ends.
8. Implementation of a two segment approach, typically 6^0 to 1000" AGL[2] with transition to 3^0.
9. Use of right-hand FCLP pattern in limited circustances where infrequent wind conditions dictate the use of a heavily noise impacted runaway for normal left-hand pattern.
10. Exclusion of other service and flying club aircraft from the field.
11. Eliminations of FCLP's.
12. Relocation of approach/departure flight corridors to avoid noise sensitive areas and make maximum use of insensitive areas such as bodies of water and highway corridors.
13. Construction of acoustical enclosures to reduce ground run-up noise.
14. Relocation of ground run-up sites to less noise sensitive areas.
15. Elimination or reduction of nighttime ground run-ups.
16. Reduction of night operations.
17. Reduction of thrust on takeoff, consistent with operational and safety considerations.
18. Institute flap and land gear management procedures on approach.
19. Concentration or dispersion of aircraft flight paths within flight corridors.
20. Concurrent utilization of multiple runaways to disperse noise impact over a wider area, thereby reducing impact intensity.
21. Power reduction at takeoff.

SOURCE: (20:4120-5)

TABLE 3 - continued

FOOTNOTES

1. FCLP/GCA - Field Carrier Landing Practice/Ground Controlled Approach

2. AGL - Above Ground Level

designated in the AICUZ study from encroachment by noise sensitive users. A variety of different controls are normally available to preclude such intrusions.

Historically, the military's use of land use controls were intended purely to protect the airfield. The need to protect the public welfare has only recently become a concern but is now fully recognized under the AICUZ program.

Effective use of land use controls requires close cooperation between the air station and the neighboring communities. Local government assumes the predominate role in the implementation of land use controls through enactment of its police powers. The United States Congress, supported by rulings from the judiciary, has consistently reinforced the state and local governments' role in their direct responsibility for ensuring that land use planning, zoning and land development in areas adjacent to airports, both military and civilian, are compatible with present and projected aircraft noise exposure in these areas. Clearly, by restricting land uses in areas exposed to excessive noise and accident potential, the publics best interest will be served.

The land use controls which are generally most useful for achieving airbase compatibility are (1) Zoning, (2) Restrictive easements and (3) Land Purchase.

5.1.2.1 Zoning

The most common and useful land use control is zoning (1:24). Zoning is an exercise of the police powers of state and local governments which designates the uses permitted on each parcel of land. It normally consists of a zoning ordinance which delineates the various use districts and includes a zoning map based upon the land use element of the community's comprehensive plan. The primary advantage of zoning is that it can promote compatibility while leaving the land in private ownership, on the tax rolls, and economically productive. The airport overlay zoning ordinance, recently enacted in Jacksonville, Florida, is a good example.

Zoning should be applied fairly and based on the local comprehensive plan. This plan must consider the total needs of the community along with the specific needs of the military air installation. To zone a parcel of land for industrial or commercial usage, for example, simply because it lies within a noise or safety impact area is insufficient. Such an action could be viewed as "arbitrary, capricious or

unreasonable" and thus vulnerable in the event of judiciary review (1:25). The plan must clearly demonstrate that there is a reasonable present or future need for such usage. Zoning can and should be used constructively to increase the value and productivity of land within the noise and accident potential zones. Used within its limitations, zoning is the preferred method of controlling land use in both noise and safety impact areas.

Zoning has a number of limitations which must be considered when using it as a compatibility implementation devise (1:25):

1. Zoning is not retroactive - Changing a particular zoning for the purpose of prohibiting a use which is already in existence is normally not possible.

2. Zoning is jurisdiction limited - Military air installations often impact more than one zoning jurisdiction. This requires coordination of the efforts of the involved jurisdiction.

3. Zoning is not permanent - In any jurisdiction, zoning can be changed by the elected governmental body. It is not legally bound by prior zoning actions. Hence, political pressures brought upon local legislators can sometimes adversely impact zoning designations. Those who

might profit from zoning changes, for example, can be powerful lobby groups.

4. Cumulative zoning - A number of communities still have cumulative type zoning ordinances which permit all "higher" uses (e.g., residential) in "lower" use (e.g., commercial or industrial) districts. This can permit some incompatible development in AICUZ areas.

5. Zoning variances - Most zoning jurisdictions permit the granting of variances or exceptions which can permit incompatible development. Construction of schools or churches, for example, are often permitted in high noise zones.

Obviously, the Navy, acting as a responsible landowner, can advise local governments on minimizing these zoning limitations. However, the basis must be factual and fully supportable.

5.1.2.2 Restrictive Easements

Easements can be used as an effective and permanent form of land use control. In many cases, they are superior for land compatibility purposes than zoning. Easements are permanent, with title held by the purchaser until sold or released, and

work equally well inside or outside zoning jurisdictions. They are directly enforceable by the holder through civil courts and may often be acquired for a small fraction of the cost of the land value. Also, the land is left free for full development consistent with noise compatible uses.

An easement is a right of another to part of the total benefits of the ownership of real property. Ownership of property consists of the possession of a series of "rights" to the utilization of that property. Certain rights in the property are always retained by the state or the general public. (i.e., Police power, right of taxation, right of eminent domain and doctrine of escheat.)

When property is acquired, usually all the rights are purchased also. (i.e., fee simple) However, it is possible to buy only the select rights which are actually needed. These can be acquired in the form of easements with the other rights retained by the owner. These easements normally accompany the property when title is passed.

There are many types of easements (1:27). They may be categorized as subsurface easements, such as as pipelines; surface easements, such as

roads or utilities; or above surface easements, such as certain air rights or avigation easements. The cost of an easement is determined by the value of those rights to the owner. If the easement will not significantly impair his contemplated usage of the land, the cost should be low. If, on the other hand, impairment is great, the cost will be higher.

Easements may also be classified in two basic classes, positive and negative. In positive easements, the right to do something with the property, for example, build a road, is acquired. In negative easements, the rights to prevent the use of the property by the property owner for certain things are acquired. These may include, for example, the owner's rights to erect billboards or cut timber (1:27).

For compatibility purposes, both the positive easement to make noise over the land and the negative easement to prevent the creation of an unprotected noise sensitive use upon the property may require acquisition to assure adequate control. The easement should give the easement owner the right of avigation and the right to make noise over the property. It should also include purchase of all the property owner's rights to

establish or maintain an unprotected noise sensitive use on the property. In the case of an existing unprotected noise sensitive use, the cost of the easement could include the cost of either soundproofing or removing the noise sensitive use from the property. A specific list of the noise sensitive uses, based upon the criteria used for the compatibility study, should be included in the easement. "Protection" for such uses should be specified as sound attenuation or other protection sufficient to place the noise sensitive uses within the sound environment specified by the criteria (1:28).

Finally, easements may be obtained in a number of ways including purchase, condemnation or dedication. For each easement acquired, consideration may be given to including a legal description of the noise that may be created over the property, the accident potential classification, classes of uses which may be established or maintained with and without soundproofing and, where applicable, an avigation easement (1:32).

5.1.2.3 Land Purchase

Purchase of noise impacted land in fee simple is the most positive of all forms of land use control. Unfortunately, it is also usually the most expensive. Acquisition can be accomplished through negotiation with the property owner, by deed or gift, or through condemnation.

5.2 Navy Acquisition Policy

Navy policy states that the first priority for acquisition in fee simple or restrictive easements is land within the clear zones whenever practicable. The second priority is other accident potential zones. High noise areas may be considered for acquisition only when all avenues of achieving compatible use zoning, or similar protection, have been examined and the operational integrity of the air installation is manifestly threatened. Acquisition will be proposed only after attempts to achieve compatible land use controls with the local community have been exhausted and the inability to achieve this preferred method of protection is well documented. Tables 4 and 5 summarizes land acquisition, transfers and exchange procedures used by the Navy.

TABLE 4

REAL ESTATE TRANSACTION

A. Land Acquisition

1. DOD Policy

a. No Military Department shall acquire more land than is needed for a project.

b. No Military Department shall acquire a greater interest in land than is required for a project, UNLESS the cost of the lesser interest approaches the cost of fee title.

c. If a greater interest is acquired, i.e. for AICUZ purposes, consideration is to be given to disposing of the fee subject to a land use restrictive easement.

2. United States Codes

a. 10 U.S.C. 2662 requires that land acquisition and disposal involving land valued at more than $100,000 or licenses and leases costing or valued at more than $100,000 per annum must be reported to the Armed Services Committee (ASC).

b. 10 U.S.C. 2676 states that no military department may acquire real property not owned by the United States (costing $100,000 or more) unless the acquisition is expressly authorized by law.

c. The Secretary of the Navy may authorize the acquisition of real property not to exceed the cost of $100,000. NOTE: Although the acquisition of easement costing less than $100,000 falls within the Secretary's delegation, which does not require reporting to ASC or congressional action, the ASC requires that the acquisition of any easement for AICUZ purposes costing less than $100,000 also be reported to them even though it is not required by law. (10 U.S.C. 2662)

3. Land Acquisition Procedures

a. The first step toward acquiring land is the authorization to acquire. This may be obtained in three ways:

(1) Minor Acquisition Authorization, $100,000 or less, has been delegated by the Secretary of Navy to Commander NAVFAC

(2) MCON Legislation - Form 1391 Project Authorization must be submitted through major claimants together with requirements and justification. The annual MCON Authorization Act and MCON Appropriation Act is processed through the Armed Services Committees and the Appropriations Committees of both the House and the Senate. This processing requires a minimum of two (2) years.

(3) Special Legislation. Congressmen may introduce special legislation relative to the acquisition of real property. This is usually related to acquisition by exchange. The action of the Congressman is to sponsor the legislation on behalf of his constituant, the non-government party. This may be separate legislation but is usually put in the General Provisions of the MCON Authorization Act.

TABLE 4 - continued

B. Land Transfers - Other United States Land

1. Intra-Navy transfers of real property are reassignments. Reassignments may be effected by concurrence of Major Claimants.

2. Land may be transferred within Services of the Department of Defense by approval o Assistant Secretary of Defense and by reporting to the Armed Services Committee.

3. Federal land may be transferred from non DOD Federal Agencies by justification of requirement and need, approval by ASD, application to GSA, and approval of OMB.

4. Land may be WITHDRAWN from the public domain for military use and purposes.

   a. Less the 5,000 acres is by Public Land Order signed by Secretary of Interior per Federal Land Policy Management Act of 1976.

   b. More than 5,000 acres requires an Act of Congress per the Engle Act of 1958.

C. Land Exchanges

1. The first requirement of an exchange transaction is the authorization to acquire. This authorization may be obtained in the same manner as land acquisition above.

2. Unless the federal land to be exchanged is stated in the legislative authority, a disposal report must be forwarded to the ASC.

3. Since exchange transactions are usually only in the authorization bill and not in the appropriations bill the federal land needs to be of higher value than private land with the difference in value to be paid in cash by the private party.

Source: (20:4130-5)

70

TABLE 5
REAL ESTATE INTERESTS TO BE CONSIDERED FOR CLEAR ZONES, ACCIDENT POTENTIAL AND NOISE ZONES

When it is determined to be necessary for the Navy to acquire interests in land, a careful assessment of the type of interest to be acquired must be made. The following is a listing of possible, but not necessarily exhaustive, interests which should be considered for applicability either in the form of a perpetual easement containing the rights or a basis for fee acquisition of the property:

1. The right to make low and frequent flights over said land and to generate noises associated with:

a. Aircraft in flight, whether or not while directly over said land,

b. Aircraft and aircraft engines operating on the ground at said base, and,

c. Aircraft engine test/stand/cell operations at said base.

2. The right to regulate or prohibit the release into the air of any substance which would impair the visibility or otherwise interfere with the operations of aircraft, such as, but not limited to steam, dust and smoke.

3. The right to regulate or prohibit light emissions, either direct or indirect, which might interfere with pilot vision.

4. The right to prohibit electrical emissions which would interfere with aircraft and aircraft communications systems or aircraft navigational systems.

5. The right to prohibit any use of the land which would unnecessarily attract birds or waterfowl, such as, but not limited to, operation of sanitary landfills, maintenance of feeding stations, etc.

6. The right to prohibit and remove any buildings or other nonfrangible structures.

7. The right to top, cut to ground level, and to remove trees, shrubs, brush or other forms of obstruction which the installation commander determines might interfere with the operation of aircraft, including emergency landings.

8. The right to ingress and egress upon, over and across said land for the purpose of exercising the rights set forth herein.

TABLE 5 - continued

9. The right to post signs on said land indicating the nature and extent of the Government's control over said land.

10. The right to prohibit land uses other than the following:

a. Agriculture
b. Livestock grazing
c. Permanent open space
d. Existing water areas
e. Communications and utilities rights of way, provided all facilities are at or below grade.

11. The right to prohibit entry of persons onto the land except in connection with activities authorized under 1.,2.,3.,and 6. of this section.

12. The right to disapprove and/or prohibit land uses not in accordance with the AICUZ land use compatibility matrix.

13. The right to control the height of structures to ensure that they do not become a hazard to flight.

14. The right to install airfield lighting and navigational aids.

15. The right to require sound attenuation in new construction or modifications to buildings in conformance with the AICUZ recommendations.

SOURCE: (2:37)

CHAPTER SIX

CONCLUSION

There is no single strategy for achieving land use compatibility around military air installations. Rather, a number of elements are required to ensure that the installation and its surrounding community coexist harmoniously.

The Navy's Land Use Compatibility (LUC) Program is an effective tool for combating the encroachment threat faced by many Naval shore activities today. This is particularly true for Naval air stations. Experience has shown that a number of elements are required to combat encroachment successfully. Early awareness of potential problems is certainly one of the key elements. Encroachment sensitivity is essential throughout the Navy's chain of command and must be part of the up-front planning process.

Integration of Navy planning with local government planning and private sector planning clearly assists in highlighting potential vulnerabilities to encroachment problems before they surface at a later time. As a major landowner and employer, the Navy must establish credible relationships with the surrounding communities and participate in local and regional decision making. Local negotiation and resolution is better than high level adjudication or court litigation.

Land use compatibility issues are both dynamic and highly complex. Navy planners must use only factual information which can be clearly articulated, supported and defended. A recognition that there are two sides to every issue is a must. An assessment of strengths and weaknesses, for each issue, should be made for the Navy's arguments and those of the "encroachers".

Finally, encroachment issues are rarely a matter of absolutes. AICUZ planning information, by its very nature, is often viewed as being subjective. Noise impact on people remains a highly elusive topic. The Navy should therefore endeavor to compromise between their own requirements and potentially conflicting community requirements. A negotiated settlement, with a clear understanding of the bottom line required to support mission requirements, is often the key. The federal government cannot rule from an ivory tower. When interacting with the private sector, some give and take must be assumed. Accomodation in many cases will forestall larger losses at a later time.

APPENDIX A
CASE STUDY: JACKSONVILLE, FLORIDA

INTRODUCTION

The Navy has a deep rooted interest in the Jacksonville Florida region. With two major air stations, a small air facility, a large Naval station and a variety of other smaller support activities, Jacksonville serves as a host city to a very large Naval presence.

The City of Jacksonville and the Navy have had, and continue to maintain, an excellent rapport. The excellent community support the Navy enjoys, in the area, has been a significant factor in the lack of major pressures from incompatible land use. However, the rapidly increasing number of new households and an expansion of the industrial base, coupled with some projected mission increases at all three Naval air installations, increases the potential for incompatible land uses in the near future (10:VII-1).

This case study will briefly examine some of these incompatible pressures, particularly as they relate to the air stations, which could compromise the Navy's mission. The new airport overlay zoning ordinance, relating to aircraft noise and accident potential, will also be discussed since

it represents the culmination of the AICUZ recommendations for the Jacksonville area.

REGIONAL OVERVIEW

The Naval installations in the Jacksonville area are, with the exception of a small part of the Naval Air Station (NAS) Cecil Field, located within the City of Jacksonville. The extreme southern portion of NAS Cecil Field is located within Clay County. (refer to figure A1)

The City of Jacksonville is somewhat unique in that it encompasses nearly the entire County of Duval. Hence, the Navy's prime political interface is with one local government organization, albeit a multi-faceted one. The surrounding Counties of Baker, Clay, Nassau and St Johns, which together with Duval county comprise the Jacksonville Metropolitan Statistical Area (MSA), also have an important impact on the Naval bases. This results from the fact that some existing and planned developments, in these counties, lie within AICUZ noise zones eminating from the air stations (10:I-1).

A brief discussion of the three main Navy activities follows:

NAS CECIL FIELD

NAS Cecil Field is one of four Navy Master Jet Bases in the United States. Located in the western

portion of Duval County, it is subdivided into three main areas comprising over 20,000 acres. The station's main mission is to provide facilities, services and material support for the operation and maintenance of naval weapons and aircraft to activities and units of the operating forces as designated by the CNO (10:II-1)

The main station contains most of the land and facilities along with with four main runways, the longest of which is 12,500 feet. It is the east coast homeport for over 300 light attack and S-3 Viking Anti-Submarine Warfare (ASW) aircraft.

Directly north of the main station is the weapons area which accomodates large quantities of aircraft weapons and ordnance. As is the case in the main station, most of the area is encumbered by AICUZ noise zones and Explosive Safety Quantity Distance (ESQD) arcs.

The third area is the Outlying Landing Field (OLF) Whitehouse which is about seven miles north of the main station. The single runway at OLF Whitehouse is exclusively used for touch and go and Field Carrier Landing Practice (FCLP) operations. OLF Whitehouse is completely encumbered by AICUZ noise zones.

NAS JACKSONVILLE

The mission of NAS Jacksonville, or NAS JAX for short, is to maintain and operate facilities and provide services and material to support operations of aviation activities and units of the operating forces as designated by CNO (3:4). The station is homeport for Patrol Wing 11 which operates seven squadrons (i.e., approximately 85 aircraft) of long range P-3C Orion ASW search and strike aircraft. Helicopter Anti-Submarine Warfare Wing One is also located here which consists of seven squadrons of H-3 Sea King helicopters.

The station lies on the west bank of the St Johns River only ten miles south of the central business district of the City of Jacksonville. The airfield consists of two main runways, the longest of which is 8,000 feet.

Adjacent to the airfield is a Naval Air Rework Facility (NARF) which is an industrial plant tasked with overhauling and refurbishing various types of Navy fleet aircraft.

Total employment at the air station exceeds 20,000 workers of which approximately 40% are civilians.

NAVAL STATION / NAVAL AIR FACILITY (NAF) MAYPORT

The mission of Naval Station Mayport is to provide, as appropriate, logistic support for the

operating forces of the Navy and for dependent activities and other commands as assigned (10:II-7). The Naval Station serves as homeport for over 32 Naval warships including two large Aircraft Carriers. NAF Mayport, recently commissioned in 1982, provides miscellaneous aviation support to a newly assigned helicopter squadron and other aircraft as assigned. Although considered a "minor" airfield, NAF Mayport accomodates extensive aircraft operations engaged in touch and go practice.

Collectively, NAS Cecil Field, NAS JAX and the Mayport Complex employ some 35,000 employees, making the Navy one of the largest employers in the City of Jacksonville (10:III-5). Although Jacksonville cannot be considered a one-industry, Navy dependent city, the Navy's economic impact has been significant. It's presence has been felt not only in terms of military and civilian personnel payrolls but by local purchases and construction and maintenance contracts (4:3).

COMPATIBLE LAND USE

The four Navy airfields, located within the City of Jacksonville, are used extensively by a variety of military aircraft. Many of these aircraft, particularly the new

F/A-18 fighter/attack type, are extremely noisy and they contribute disproportionately to the noise environment. Additionally, there are also two general aviation facilities as well as a growing international airport which coexist there (4:7).

AICUZ plans have been developed for NAS Cecil Field and NAS JAX since 1976. NAF Mayport recently had an AICUZ plan completed. These plans describe the noise and accident potential environments around their respective airfields and serve to guide land use planning efforts both on and off base.

The City of Jacksonville promulgated an airport overlay zoning ordinance for aircraft noise and accident potential, in 1978, primarily due to the urging of Navy officials (18:III-11). Termed the AICUZ ordinance because it embodied the precepts of the AICUZ plans, it covered all airfields within Jacksonville, military and civilian alike. This ordinance greatly helped protect the missions of the Navy's air stations in the city (7).

Unfortunately, in 1984, the Florida Circuit Court overturned the ordinance on technical grounds (18:III-11). The court ruled that the city failed to follow required administrative procedures for the public hearing and comment process prior to its formal adoption. Despite this setback, the Navy and City persevered and were successful in re-instituting a new ordinance in March 1985. This new

ordinance, while badly needed, differed considerably from the overturned one (19).

In 1980, the Navy chose to base a new type of attack aircraft, the F/A-18 Hornet, at NAS Cecil Field starting in fiscal year 1984 (10:VII-1). This particular aircraft, currently replacing the smaller A-7E Corsair II, is considerably noiser than the latter. In addition, a new type of helicopter, the Light Airborne Multi-purpose System (LAMPS) Mark III, was selected for homeporting at NAF Mayport. The additional noise and accident potential created by this new helicopter plus the requirement to overhaul both new types of aircraft at the NARF, located at NAS JAX, resulted in revision requirements to all three AICUZ plans. Clearly, the noise contours would have to be expanded (10:II-1).

The AICUZ plans were revised and the pertinent data submitted to the city for inclusion in the revised zoning ordinance. Fortunately, the expanded noise footprint and accident potential data was readily accepted and subsequently incorporated into the new ordinance (19). Attachment A-1 is a copy of the newly enacted Jacksonville zoning ordinance.

An evaluation of the new zoning ordinance reveals a number of flaws with regard to land use controls. The original ordinance included land use controls in both the high and moderate noise zones (i.e., Zones 3 and 2

respectively.) as well as clear zones and both APZ's. The new ordinance, reflecting the noise zones for the F/A-18 Hornet, fails to address the moderate noise zone. If the new moderate noise zone were included in the ordinance, about 15% to 20% of Duval County would have been affected. This appeared to have been politically unacceptable to the city government (19).

A second factor which contributed to the exclusion of the moderate noise zone was that the primary effect would have been on zoning for mobile homes. Zoning would not have allowed mobile homes unless they had specified levels of acoustic insulation. Another politically unacceptable situation. Much of the necessary data on acoustic insulation for mobile homes has yet to be developed hence the ordinance could not be enforced (19).

The ratified airport overlay zoning ordinance illustrates an apparant weakness relating to the Navy's role in enacting AICUZ developed land use controls. The Navy assumed the role of a "peripheral player" in the political negotiation process which ultimately shaped the ordinance. The realities of the political arena precluded the adoption of the Navy's AICUZ land use control recommendations thereby limiting its effectiveness. This weakness becomes even more acute when the very basis of noise and APZ zone development is questioned as is occurring in other areas of the country.

The political environment needs to be closely monitored and understood to preclude these adverse situations.

Existing or potential land use that is incompatible to the Navy's mission is often not as easily identifiable as are the AICUZ related noise and safety issues (10:VII-2). The AICUZ program focuses on the measurement of aircraft impacts on an area and on determining what types of land use may prove incompatible. Repeated vocal citizen complaints about aircraft noise may eventually lead to mission degredation or changes. However, more subtle occurrences in the area may also eventually result in mission degredation. The following list summarizes the other types of incompatible pressures which currently possess the potential to degrade the Navy's mission in Jacksonville (10:VII-2).

1. Expanding population
2. Water supply considerations
3. Transportation requirements
4. Joint use of Navy land/facilities
5. Increased commercial/private aviation interference
6. Environmental limitations

Expanding population

An expanding population, less dependent on the Navy, could generate land use pressures on the Navy. A growing population requires new housing along with a utilities support network and transportation systems.

Much of the land available for this expansion is in the vicinity of Jacksonville's three main Navy activities. The demand for land, coupled with decreased dependence on the Navy, could lead to pressures to amend the city's comprehensive plan and zoning. The new zoning ordinance, for instance, could be revised or attempts made to overturn it. Public support for the AICUZ ordinance could diminish as the land it impacts becomes more valuable.

Water Supply Considerations

Jacksonville depends soley on a deep aquifer for its fresh water supply. Droughts over the last several years have raised concern as to the adequacy of these aquifers to support local water requirements. An expanding population places further strains on this supply that could, in conjunction with a severe drought, lead to degredation of the supply and restrictions on use. Of perhaps greatest risk to the Navy, in this regard, is the potential salt water intrusion to the wells at the Mayport complex.

Transportation Requirements

An expanding population, with its associated congestion, requires new or improved roads to enhance mobility. The Navy, in some instances, is being singled

out as being the cause of these requirements. This results in local efforts to require the Navy to help pay for the improvements. Local officials are attempting to obtain funding, for certain new roads, under the Defense Highway program and therefore funded by DoD. Each success will motivate the community to try for additional Navy-supported projects.

Joint Use of Navy Land/Facilities

Some pressure exists to permit the joint use of Navy land or facilities by the community. Any joint use proposals must be carefully considered as to their potential impact on the activity's mission. Safety, security and other considerations often preclude approval but all requests must be not be categorically rejected due to the adverse impact on Navy community relations.

Increased Commercial/Private Aviation Interference

Naval air operations are increasingly subject to encroachment within the air. Navy controlled air space is already severely restricted because major Federal Aviation Administration (FAA) air traffic control routes pass over the area. Increased commercial air traffic could lead to alterations that could further restrict Navy aircraft flight patterns.

The expansion of private aircraft operations has likewise created an interference problem. The two general aviation airports generate considerable traffic which has, on occasion, interfered with Navy aircraft and air space. Although both airports are currently operating at less than half of rated capacities, an expansion could severely impact the Navy (10:VII-3).

Environmental Limitations

Many environmental issues have the potential of degrading Navy operations in the Jacksonville area. Environmental awareness has led to a variety of federal, state and local laws which also impact the Navy in various ways. Although compliance with these laws may not seriously hamper operations, they will often lead to increased costs. Identification of these land use pressures are not as easily identifiable as the other physical occurrances but nonetheless require careful monitoring.

A current example relates to a 1982 Florida statute covering the regulation of storm water discharge. Under this law, the regulation of storm water discharge will add significantly to the costs of some types of new facilities and will increase the amount of land required for their construction. The law requires the prevention of a given volume of storm

water runoff into surface waters of the state by complete on-site storage where the capacity to store the storm water is provided within 72 hours following the storm event. The storage facilities must provide retention or detention with filtration of the runoff from the first one inch of rainfall or, as an option for projects or project subunits with drainage areas less than 100 acres, facilities which provide retention or detention with filtration of the first one half inch of runoff.

For the three Jacksonville air stations, this law will have its greatest impact on projects involving large paved areas such as aircraft parking aprons and facilities requiring large amounts of vehicle parking. Additional land may be required in some cases for retention ponds to trap the runoff (10:VII-4).

These examples of land use and potential air space pressures illustrate the diversity and dynamic nature of the encroachment problems faced by the Navy in Jacksonville. It is impossible to predict accurately all types and sources of pressures which will occur due to the dynamics of the population changes in the region. It is therefore incumbent upon the Navy to continually monitor the growth process and assess the encroachment impacts at

an early stage. Only by doing so can much larger problems be forestalled at a later time.

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ATTACHMENT A-1

AN ORDINANCE CONCERNING ZONING, REPEALING PART 10, CHAPTER 656, ORDINANCE CODE AND CREATING A NEW PART 10, CHAPTER 656 RELATING TO AIR INSTALLATION COMPATIBLE USE ZONES (AICUZ); RESTRICTING LAND USES IN CERTAIN ZONES SURROUNDING CERTAIN AIRPORTS; DESCRIBING THOSE ZONES; MAKING CERTAIN PROVISIONS OF SECTION 656.240, ORDINANCE CODE REQUIRING MAILING OF NOTICES AND POSTING OF SIGNS CONCERNING THIS ORDINANCE INAPPLICABLE TO THIS ORDINANCE; MAKING ADMINISTRATIVE DETERMINATIONS; AMENDING THE ZONING ATLAS OF THE CITY OF JACKSONVILLE; ADOPTING CERTAIN PANELS UPON WHICH THE AIRPORT NOISE AND ACCIDENT POTENTIAL ZONES ARE OVERPRINTED FOR USE IN CONNECTION WITH PART 10 OF THE ZONING CODE; PROVIDING AN EFFECTIVE DATE.

BE IT ORDAINED by the Council of the City of Jacksonville:

Section 1. Part 10, Chapter 656, Ordinance Code is repealed and a new Part 10, Chapter 656 is created to read as follows:

Part 10. Regulations Related to Airports and Lands Adjacent Thereto

Subpart A. General Regulations

656.1001. Findings. The Council finds and determines as follows:

a) There exist around airports within the City of Jacksonville noise zones and accident potential zones potentially inimical to the health, safety and general welfare of the citizens of the City of Jacksonville.

b) It is necessary and proper for the City, in the exercise of its police power of land use regulation, to restrict land uses within these zones so as to minimize their potential detrimental effects on its citizens.

c) The noise zones and accident potential zones described in this part constitute more than five percent of the land area of the City.

d) The Planning Commission considered this part and rendered an advisory opinion.

e) The Rules Committee, after due notice and public hearing, has made its recommendation to the Council.

f) Taking into consideration the above recommendations, the Council finds that this part is consistent with the comprehensive plan adopted under Chapter 650.

656.1002 Intent. It is the intent of this part to promote the health, safety and general welfare of the inhabitants of the City by preventing the creation, establishment or maintenance of hazards to aircraft, preventing the destruction or impairment of the utility of the airports in the City and the public investment therein and protecting the lives and properties of owners or occupants of lands in the vicinity of airports as well as the users of airports; and to aid and implement the overriding federal interest in safe operation of airports and the security of land surrounding airports.

656.1003 Applicability. The regulations on land use set forth herein are applicable to all lands lying within delineated airport noise, accident potential and airspaces zones adopted as a part of the Zoning Atlas as provided in s. 656.202. Notwithstanding the zoning district regulations set out in Part 3, the provisions of this part as they apply to a parcel of land shall override and supersede other

regulations set forth in this Zoning Code to the extent set forth herein based upon the airport noise, accident potential or airspace zone or zones in which the parcel is located.

656.1004 Definitions. For the purposes of this part:

(a) accident potential hazard area (APHA) means an area within five thousand feet of the approach or departure end of a runway or in proximity to an airport in which aircraft may maneuver after takeoff or before landing and are subject to the greatest potential to crash into a structure or the ground.

(b) accident potential zone A, as applied to military airfields, means the area seven hundred fifty feet on either side of the runway centerline plus the clear zone immediately beyond the end of the runway which possesses a high potential for accidents. The clear zone means the fan-shaped area one thousand, five hundred feet wide at the end of the runway expanding to two thousand, two hundred eighty-four feet wide, three thousand feet from the end of the runway.

(c) accident potential zones (APZs) mean areas lateral to and immediately beyond the ends of runways and along primary flight paths.

(d) AICUZ (air installation compatible use zones) program is a program to protect the public's safety, health and welfare while forestalling degradation of the operational capability of airports. The main intent of the AICUZ program is to insure that development of surrounding lands will be compatible with the noise levels and accident potential associated with airport operations.

(e) airport includes all of the following:

(1) Jacksonville International Airport.

(2) Craig Airport.

(3) Herlong Airport.

(4) Naval Air Station, Jacksonville, Florida.

(5) Naval Air Station, Cecil Field, Florida, including the outlying landing field, Whitehouse, Florida.

(6) Naval Air Facility, Mayport, Florida.

(f) airport elevation means the highest point of an airport's usable landing area measured in feet above mean sea level.

(g) airport environs mean those areas which are identified according to their accident potential and/or noise rating.

(h) airport obstruction means a structure or object of natural growth or use of land which would exceed the federal obstruction standards as contained in 14 CFR ss. 77.21, 77.23, 77.25 and 77.28, which obstructs the airspace required for flight of aircraft in landing and takeoff at an airport or which is otherwise hazardous to the landing or taking off of aircraft.

(i) airspace height means the determination of height limits in all zones set forth in this part, the datum of which shall be above mean sea level elevation (AMSL) unless otherwise specified.

(j) day/night average sound level (Ldn) is a basic measure for quantifying noise exposure, being the A-weighted sound level energy average over a twenty-four-hour time period, with a ten-decibel penalty applied to nighttime (10:00 p.m. to 7:00 a.m.) sound levels.

(k) dbA is a unit of corrected noise level providing a measurement of noise in accordance with levels actually heard by the ear, based on an A-weighted scale.

(l) decibel (db) is a unit for measuring the relative loudness of sound or sound pressure equal approximately to the smallest degree of difference of loudness or sound pressure ordinarily detectable by the human ear, the range of which includes about one hundred thirty decibels on a scale beginning with one for the faintest audible sound.

(m) minimum descent altitude means the lowest altitude, expressed in feet above mean sea level, to which descent is authorized on final approach or during circling-to-land maneuvering in execution of a standard instrument approach procedure where no electronic glide slope is provided.

(n) minimum vectoring altitude means the lowest mean sea level altitude at which an aircraft on instrument flight rules will be vectored by a radar controller, except when otherwise authorized for radar approaches, departures and missed approaches.

(o) nonprecision-instrument runway means a runway having a nonprecision-instrument approach procedure utilizing air navigation facilities with only horizontal guidance or area-type navigation equipment, for which a straight-in nonprecision-instrument approach procedure has been approved or planned and for which no precision approach facilities are planned or indicated on an FAA planning document or a military service's military airport planning document.

(p) precision-instrument runway means a runway having an instrument approach procedure utilizing an instrument landing system (ILS) or a precision approach radar (PAR). It also means a runway for which a precision approach system is planned and is so indicated on an FAA-approved airport layout plan; a military service's approved military airport layout plan; another FAA planning document; or a military service's military airport planning document.

(q) structure means an object constructed or installed by man, including buildings, towers, smokestacks, utility poles and overhead transmission lines.

656.1005 Airport environs; accident potential zones (APZs) and noise zones.

(a) Airport environ zones are designated in accordance with Table 656.1.

Table 656.1

Area	Characteristics
A	Accident Potential Zone A
B	Accident Potential Zone B
C	Accident Potential Zone C
B3	Accident Potential Zone B and Noise Zone 3
B2	Accident Potential Zone B and

Noise Zone 2

C3 Accident Potential Zone C and
Noise Zone 3

C2 Accident Potential Zone C and
Noise Zone 2

3 Noise Zone 3

2 Noise Zone 2

APHA Airport Potential Hazard Area

(b) Accident potential zones (APZs) are divided into three types of zones along primary flight paths, which are designated as Zone A, Zone B and Zone C. Zone A is an area which possesses a high potential for accident. Zone B is the area normally beyond Zone A which possesses a significant potential for accidents. Zone C is an area normally beyond Zone B having a measurable potential for accidents.

(c) The airport noise zones are defined in Table 656.2.

Table 656.2

Airport Noise Zone	Ldn Values
1	Less than 65
2	65-75
3	Greater than 75

Subpart B. Regulations Applicable to Designated Civilian and Military Airport Environs

656.1011 Allowable land uses. Notwithstanding the zoning district regulations contained elsewhere in this chapter, the allowable land use for a parcel of land lying within an adopted public civil airport noise zone or military airport AICUZ zone shall be modified as set forth in this section.

(a) The land use objectives shown in Table 656.3 shall determine, subject to the zoning classification of the parcel, allowable land uses for the airport environs area

within which a given parcel of land lies.

(b) Land use objectives are delineated in three categories:

(1) Unacceptable development, which means that, even though otherwise permitted in the zoning classification of the parcel, the land use is prohibited as delineated by Table 656.3 and a prohibited use existing at the time of adoption of these regulations shall be considered a nonconforming use.

(2) Conditional new development, which means that, even though otherwise permitted in the zoning classification of the parcel, prior to commencement of the land use indicated, the use shall meet the guidelines set forth in Table 656.3. A use existing at the time of adoption of these regulations and not meeting the requirements set forth herein shall be considered a nonconforming use subject to the provisions of s. 656.1025.

(3) Acceptable development, which means that the provisions of the appropriate zoning classification of the parcel shall apply without modification.

TABLE 656.3

Land Use Category	Airport Environ Areas A	B3	B2	B1	C3	C2	C1	3	2	APHA
Residential:										
Single-family dwelling	X	C21,24	C17,24	C24	C16,21	C16,17	C16	C21	C17	
Mobile home	X	X	C24	C24	X	C16	C16	X	0	
Multi-family dwelling	X	X	X	X	X	X	X	C21	C17	
Mobile home park	X	X	X	X	X	X	X	X	0	
Foster care/family care home	X	C21,24	C17,24	C24	C16,21	C16,17	C16	C21	C17	
Group care home & similar uses	X	X	X	X	X	X	X	C21	C17	
Rooming house/boarding house	X	X	X	X	X	X	X	C21	C17	
Commercial:										
Retail outlets for the sale of general merchandise including sale of food, wearing apparel and similar uses	X	X	X	X	C6	C13	0	C6	C13	
Retail sales of building materials, hardware, farm equipment, new or used automobiles, mobile homes, boats and similar uses	X	C5	C12	0	C5	C12	0	C5	C12	
Commercial parking lot	X	0	0	0	0	0	0	0	0	
Retail sale of furniture, home furnishings and similar uses	X	X	X	X	C6	C12	0	C6	C12	
Service establishments such as restaurants (including drive-in restaurants), service of alcoholic beverages and similar uses	X	X	X	X	X	X	X	C14	C6	

Table 656.3

Land Use Category	Airport Environ Areas A	B3	B2	B1	C3	C2	C1	3	2	APHA
Commercial:										
All types of professional and business offices, personal services, professional or business including building trades contractors and similar uses	X	X	X	X	C14	C6	0	C14	C6	
Commercial indoor recreational or entertainment facilities	X	X	X	X	C14	C6	0	C14	C6	
Repair Services and service garages including automobile repair, radio and televsion repair and similar uses	X	C6	C13	0	C6	C13	0	C6	C13	
Automobile service station, including convenience store	X	0	0	0	0	0	0	0	0	
Motel or hotel	X	X	X	X	X	X	X	C21	C17	
Radio and television broadcasting offices and studios, telephone exchange and similar uses	C3	C5	C12	0	C5	C12	0	C5	C12	
Medical and other health services such as hospitals, clinics and similar uses	X	X	X	X	X	X	X	C6	C14	
Industrial:										
Wholesaling, warehousing storage or distribution establishments, assembling of components and similar uses	X	C5	C12	0	C5	C12	0	C5	C1	

Table 656.3

Land Use Category	Airport Environ Areas A	B3	B2	B1	C3	C2	C1	3	2	APHA
Freight, bus, traveling, shipping or other transportation terminals	X	C5	C12	O	C5	C12	O	C5	C12	
Manufacturing of food and kindred products, textile mill products and similar uses	X	X	X	X	C5	C12	O	C5	C12	
Manufacturing of apparel, chemicals and allied products, petroleum refining and related activities, rubber and miscellaneous plastic products and similar uses	X	X	X	X	X	X	X	C5	C12	
Manufacturing of lumber and wood products, furniture and fixtures, paper and allied products, stone, clay and glass products, primary metal including fabrication of metal products and similar uses	X	C5	C12	O	C5	C12	O	C5	C12	
Printing, lithography, publishing or similar establishments	X	C5	C12	O	C5	C12	O	C5	C12	
Manufacturing of (professional, scientific and control instruments), prosthetic appliances, dentures, eyeglasses, hearing and similar products	X	X	X	X	X	X	C12	X	C5	

Table 656.3

Land Use Category	Airport Environ Areas A	B3	B2	B1	C3	C2	C1	3	2	APHA
Public and Quasi-public Services:										
Cemetaries	X	C7	C7	C7	C7	C7	C7	0	0	
Churches	X	X	X	X	X	X	X	X	C14	
Governmental services such as offices, fire stations, postal services and prisons	X	X	X	X	X	C13,18	C20	C6	C14	
Schools	X	X	X	X	X	X	X	X	C14	
Cultural Activities such as libraries, museums, art galleries and similar uses	X	X	X	X	X	X	X	X	C14	
Private Clubs and similar uses which provide for public assembly	X	X	X	X	X	X	X	X	C14	
Outdoor Recreation:										
Playgrounds, neighborhood parks	X	X	X	X	X	C19	C19	X	0	
Community and regional parks	X	C8	C8	C8	C8	C8	C8	0	0	
Nature exhibits	X	C6	C13	0	X	C13	0	C6	0	
Spectator sports, including arenas	X	X	X	X	X	X	X	X	0	
Golf courses, riding stables and similar uses	X	C9,10	C9,10	C9,10	C9,15	C9,15	C9,15	C22	0	
Private camps (including day camps)	X	X	X	X	X	X	X	C23	0	

Table 656.3

Land Use Category	Airport Environ Areas A	B3	B2	B1	C3	C2	C1	3	2	APHA
Entertainment assembly, amphitheater, music shell and similar uses	X	X	X	X	X	X	X	X	X	
Resource Production, Extraction and Open Land:										
Agriculture, including livestock grazing	C2	0	0	0	0	0	0	0	0	
Livestock farms, animal breeding	X	X	0	0	X	0	0	X	0	
Agriculture-related activities	X	0	0	0	0	0	0	0	0	
Forestry	C3	0	0	0	0	0	0	0	0	

0 ... Acceptable development
X ... Unacceptable development
C ... Conditional development, with conditions as noted.

Table 656.3

1 No passenger terminals are permitted.
2 No structures (except airfield lighting), buildings or aboveground utility/communication lines shall be located in Accident Potential Zone A.
3 Permitted only within height constraints.
4 Controlled hunting and fishing is permitted only for wildlife control.
5 Compatible development is conditioned on design and construction providing for a noise level reduction (NLR) of thirty decibles, A-weighted (dbA), in reception, office and employee lounge areas.
6 Compatible development is conditioned on design and construction providing for a NLR of thirty dbA throughout the facility.
7 Chapels not permitted.
8 Development is subject to the condition that spectator stands are not built at athletic fields.
9 Development is subject to the condition that clubhouses are not built as part of this land-use operation.
10 Development is subject to the condition that concentrated rings with classes larger than twenty-five are not built as part of this land-use operation.
11 Residential structures are not permitted.
12 Compatible development is conditioned on design and construction providing for a NLR of twenty-five dbA in reception, office and employee lounge areas.
13 Compatible development is conditioned on design and construction providing for a NLR of twenty-five dbA throughout the facility.
14 Compatible development is conditioned on design and construction providing for a NLR of thirty dbA throughout the facility.
15 Development is subject to the condition that concentrated rings with classes larger than fifty are not built as part of this land-use operation.
16 Development is subject to the condition that minimum lot size shall be one-half acre for each dwelling unit.
17 Compatible development is conditioned in dwelling design and construction providing for a NLR of twenty-five dbA.
18 Development is subject to the condition that meeting places, auditoriums and so forth for a gathering of more than twenty-five people are not built as part of this land-use operation.
19 Development is subject to the condition that the park is oriented toward forest trails and similar activities which do not concentrate groups of people greater than fifty. Playgrounds are not permitted.
20 Development is subject to the condition that meeting places, auditoriums and so forth for a gathering of more than fifty people are not built as part of this land-use operation.
21 Compatible development is conditioned on residential unit design and construction providing for a NLR of thirty dbA.
22 Compatible development is conditioned on design and construction providing for a NLR of thirty dbA in the clubhouse.
23 Compatible development is conditioned on design and construction providing for a NLR of thirty dbA in permanent residential units and twenty-five dbA in other permanent structures.
24 Development is subject to the condition that minimum lot size for each dwelling unit shall be one and one half acres.

Subpart C. Regulations Applicable to Established Military and Civil Airport Height Zones

656.1015 Airport zones and airspace height limitations. In order to carry out the provisions of this part, there are hereby created and established certain zones which include all the land lying beneath the approach, transitional, horizontal and conical surfaces as they apply to a particular airport. The area located in more than one of the described zones is considered to be only in the zone with the more restrictive height limitation. The various zones are hereby established and defined as follows:

(a) Public civil airport height zones and limitations.

(1) Primary zone is an area longitudinally centered on a runway, extending two hundred feet beyond each end of that runway with the width so specified for each runway for the most precise approach existing or planned for either end of the runway. No structure or obstruction will be permitted within the primary zone that is not part of the landing and takeoff area and is of a greater height than the nearest point on the runway center line. The width of the primary zone is as follows:

(i) Jacksonville International Airport.Runways 07L, 07C, 07R, 25R, 25C, 13 and 31—one thousand feet for a nonprecision-instrument approach with visibi-lity minimums as low as three-fourths of a statute mile, and for precision-instrument runways.

(ii) Craig Airport.

(A) Runways 13R and 31L—five hundred feet for nonprecision-instrument runways having visibility minimum greater than three-fourths of a statute mile.

(B) Runways 13L, 31R, 04 and 22—five hundred feet for visual runways having only visual approaches.

(iii) Herlong Airport. Runways 07L, 07R, 25R, 25L, 11 and 29—five hundred feet for visual runways having only visual approaches.

(2) Horizontal zone is the area around each civil airport with an outer boundary the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the primary zone of each airport's runway and connecting the adjacent arcs by lines tangent to those arcs. The radius of each arc is:

(i) Jacksonville International Airport.Runways 07L, 07C, 07R, 25R, 25C, 25L, 13 and 31—ten thousand feet for all runways designated as other than utility or visual.

(ii) Craig Airport.

(A) Runways 13R and 31L—five hundred feet for nonprecision-instrument runways having visibility minimum greater than three-fourths of a statute mile.

(B) Runways 13L, 31R, 04 and 22—five hundred feet for visual runways having only visual approaches.

(iii) Herlong Airport. Runways 07L, 07R, 25R, 25L, 11 and 29—five hundred feet for visual runways having only visual approaches.

The radius of the arc specified for each end of a runway will have the same arithmetical value. That value will be the highest composite value determined for either end of the runway. When a five-thousand-foot arc is encompassed by tangents connecting two adjacent ten-thousand-foot arcs, the five-thousand-foot arc shall be disregarded in the construction of the perimeter of the horizontal zone. No structure or obstruction will be permitted in the horizontal zone that has a height greater than one hundred fifty feet above the airport height.

(3) Conical zone is the area extending outward from the periphery of the horizontal zone for a distance of four thousand feet. Height limitations for structures in the conical zone are one hundred fifty feet above airport height at the inner boundary with permitted height increasing one foot vertically for every twenty feet of horizontal distance measured outward from the inner boundary to a height of

three hundred fifty feet above airport height at the outer boundary.

(4) Approach zone is an area longitudinally centered on the extended runway center line and extending outward from each end of the primary surface. An approach zone is designated for each runway based upon the type of approach available or planned for that runway end.

(i) The inner edge of the approach zone is the same width as the primary zone and it expands uniformly to a width of:

(A) Jacksonville International Airport.Runways 07L, 07C, 07R, 25R, 25C, 25L, 13 and 31--sixteen thousand feet for precision-instrument runways.

(B) Craig Airport-Runways 13R and 31L-five hun-dred feet for nonprecision-instrument runways having visibility minimum greater than three-fourths statute mile and Runways 13L, 31R, 04 and 22--five hundred feet for visual runways having only visual approaches.

(C) Herlong Airport-Runways 07L, 07R, 25R, 25L, 11 and 29--five hundred feet for visual runways having only visual approaches.

(ii) The approach surface extends for a horizontal distance of:

(A) Jacksonville International Airport.Runways 07L, 07C, 07R, 25R, 25C, 25L, 13 and 31--fifty thousand feet for all precision-instrument runways.

(B) Craig Airport-Runways 13R and 31L--ten thou-sand feet for all nonprecision-instrument runways other than utility.

(C) Herlong Airport-Runways 07L, 07R, 25R, 25L, 11 and 29--five hundred feet for visual runways having only visual approaches.

(iii) The outer width of an approach zone to an end of a runway will be that width prescribed in this subsection for the most precise approach existing or planned for that runway end.

(iv) Permitted height limitation within the approach zones is the same as the runway end height at the inner edge and increases with horizontal distance outward from the inner edge as follows:

(A) Jacksonville International Airport.Runways 07L, 07C, 07R, 25R, 25C, 25L, 13 and 31—permitted height increases one foot vertically for every fifty feet of horizontal distance for the first ten thousand feet and then increases one foot vertically for every forty feet of horizontal distance for an additional forty thousand feet for all precision-instrument runways.

(B) Craig Airport-Runways 13R and 31L—permitted height increases one foot vertically for every thirty-four feet of horizontal distance for all nonprecision-instrument runways other than utility and Runways 07L, 07R, 25R, 25L, 11 and 29—permitted height increases one foot vertically for every twenty feet of horizontal distance for all utility and visual runways.

(5) Transitional zone is the area extending outward from the sides of the primary zones and approach zones connecting them to the horizontal zone. Height limits within the transitional zone are the same as the primary zone or approach zone at the boundary line where it adjoins and increases at a rate of one foot vertically for every seven feet horizontally, with the horizontal distance measured at right angles to the runway centerline and extended centerline, until the height matches the height of the horizontal zone or conical zone or for a horizontal distance of five thousand feet from the side of the part of the precision approach zone that extends beyond the conical zone.

(6) Other areas: In addition to the height limitations imposed in paragraphs (1)-(5), no structure or obstruction will be permitted within the City that would cause a minimum obstruction clearance altitude, a minimum descent altitude, a decision height or a minimum vectoring altitude to be raised.

(b) Military airport zones. The United States Navy is exempt from the provision of this part for areas under its authority which include NAS Jacksonville. Runways 09, 27, 13 and 31, NAS Mayport. Runways 04 and 22, Cecil Field-Runways 18L, 18R, 36R, 36L, 09L, 09R, 27R and 27L and OLF Whitehouse-Runways 11 and 29.

(1) Primary zone is an area located on the ground or water, longitudinally

centered on each runway and extending two hundred feet beyond the runway end. The width of the primary zone is one thousand, five hundred feet.

(2) Clear zone is the fan-shaped area adjacent to the landing threshold and expanding to two thousand, two hundred eighty-four feet wide, three thousand feet from the threshold at an angle of 7°58'11" commencing two hundred feet from the threshold.

(3) Inner horizontal zone is the area encompassing the runways, primary zone and clear zone with an outer perimeter formed by swinging arcs of seven thousand, five hundred foot radius about the center line at the end of each primary zone and connecting adjacent arcs by lines tangent to these arcs. No structure or obstruction will be permitted in the inner horizontal zone of a greater height than one hundred fifty feet above the airport elevation.

(4) Conical zone is a surface extending from the periphery of the inner horizontal surface outward and upward at a slope of twenty to one to a height of five hundred feet above the established airfield elevation.

(5) Outer horizontal zone is the area extending outward from the outer periphery of the conical zone for a distance of thirty thousand feet. The height limit within the outer horizontal zone is five hundred feet above air-port elevation.

(6) Approach zone is the area longitudinally centered on each runway center line, with an inner boundary two hundred feet out from the end of the runway and the same width as the primary zone, then extending outward for a distance of fifty thousand feet, expanding uniformly in width to sixteen thousand feet at the outer boundary. Height limits within the approach zones commence at the height of the runway end and increase at the rate of one foot vertically for every fifty feet horizontally for a distance of twenty-five thousand feet, at which point it remains level at five hundred feet above airport elevation to the outer boundary.

(7) Transitional zone is the area with an inner boundary formed by the side of the primary zones and the approach zones, then extending outward at a right

angle to the runway centerline and extended center line until the height matches the adjoining inner horizontal zone, conical zone and outer horizontal zone height limit. The height limit at the inner boundary is the same as the height of the adjoining inner horizontal zone and increases at the rate of one foot vertically for every seven feet horizontally to the outer boundary of the transitional zone, where it again matches the height of the adjoining outer horizontal zone.

Subpart D. Miscellaneous Use Regulations, Variances and Nonconforming Uses

656.1021 Uses which interfere with aircraft. It shall be unlawful and a violation of this Zoning Code to establish, maintain or continue a use within an airport accident potential, noise or height zone in a manner as to interfere with the operation of airborne aircraft. The following special requirements shall apply to each use lawfully established in the zones:

(a) Lights or illumination used in conjunction with street, parking, signs or use of land and structures shall be arranged and operated in such a manner that it is not misleading or dangerous to aircraft operating from an airport or in the vicinity thereof as determined by the airport operator.

(b) No operations of any type shall produce smoke, glare or other visual hazards within three statute miles of a usable runway of a designated airport.

(c) No operations of any type shall produce electronic interference with navigation signals or radio communication between the airport and aircraft.

(d) No use of land shall be permitted which encourages large concentrations of birds or waterfowl within the vicinity of an airport.

656.1022 Lighting. Notwithstanding the provisions of s. 656.1021, the owner of a structure over two hundred feet above ground level shall install lighting in accordance with Federal Aviation Administration Advisory Circular 70-7460-1 Series and Amendments thereto on the structure. Additionally, high-intensity white obstruction lights shall be installed on a high structure which exceeds seven hundred

forty-nine feet above mean sea level. The high-intensity white obstruction lights must be in accordance with the Federal Aviation Administration Advisory Circular 70-7460-1E and Amendments.

656.1023 Variances. The Planning Commission shall not act upon a request for a variance from the provisions of this Zoning Code affecting lands lying within a airport environ or height zone until the Planning Commission has received an advisory opinion from the Airport Zoning Advisory Committee established pursuant to s. 656.1028. When the division of a lot of record existing on the effective date of this part by an airport environ zone boundary line makes impractical the reasonable use of the lot, the Planning Commission may, when not contrary to the public interest or the spirit and intent of this part, move the boundary line to wholly encompass or exclude the lot from the zone by zoning variance.

656.1024 Hazard marking and lighting. A permit or variance granted shall require the owner to mark and light the structure in accordance with Federal Aviation Administration Advisory Circular 70-7460-1 Series. The permit may be conditioned to permit the United States Navy or the City, at its own expense, to install, operate and maintain markers and lights necessary to indicate to pilots the presence of an airspace hazard if special conditions so warrant.

656.1025 Nonconforming uses and structures. To the extent set forth herein, the restrictions on nonconforming uses and structures contained in Part 7 are modified or supplemented as follows:

(a) The owner of a nonforming structure shall allow the installation, operation and maintenance during hours of darkness of the markers and lights deemed necessary by the airport's administrative official to indicate to the operators of aircraft in the vicinity of the airport the presence of the structures or aircraft hazards. The markers and lights shall be installed, operated and maintained at the expense of the owners of the airport concerned.

(b) The owner of a tree or other natural growth which exceeds the limitations

on height as provided in this Zoning Code shall allow the owner of the airport at its expense to make lower, remove or take other action necessary to bring the tree or growth into conformity with this Zoning Code.

(c) A use which is nonconforming by virtue of the regulations contained in this part may be structurally altered, reconstructed or replaced provided there is no increase in the floor area of a structure. The floor area of single-family dwelling, including mobile homes, may be increased, however, if the structural alteration, reconstruction or addition provides for the sound attenuation required by the airport noise zone within which the parcel is located.

A mobile home which is nonconforming by virtue of the regulations contained in this part may be replaced with another mobile home, regardless of size, without being required to meet the sound attenuation requirements for the airport noise zone within which the parcel is located.

(d) Notwithstanding other provisions of this part, a mobile home park existing on the effective date of this part may place a mobile home not meeting the requirements of this part within the park on each mobile home space established as existing on the effective date of this Part by the Public Health Division (Sanitary Engineering Branch), the Bio-Environmental Services Division or the Building and Zoning Inspection Division.

(e) If a nonconforming use, by virtue of the regulations contained in this part, ceases for any reason for a period of twelve consecutive months, the subsequent use shall conform to the regulations of this part.

(f) Notwithstanding any provisions of this part to the contrary, lots of record on the effective date of this part shall be deemed to conform to the minimum lot area provisions of this part or of any zoning district subsequently approved which application has been filed with the Building and Zoning Inspection Division prior to the effective date of this part.

(g) Nothing in this part shall be construed to impose minimum lot area

requirements greater than minimum lot area requirements of the zoning district of any parcel on the effective date of this part.

656.1026 Appeals. Where it is alleged that there is error in an order, requirement, decision or determination made by the Chief, Building and Zoning Inspection Division in the administration or interpretation of this part, an appeal may be made to the Planning Commission in accordance with s. 658.104.

656.1027 Helicopter landing sites. A landing site for helicopters or other vertical takeoff aircraft shall be a permitted use in a zoning district; provided, that this use shall not be established in a location other than an airport until a permit therefor shall have been authorized by a resolution adopted by the Council and FAA airspace authorization and State licensing requirements have been obtained pursuant to Chapter 330, Florida Statutes.

656.1028 Airport Zoning Advisory Committee.

(a) There is hereby established an Airport Zoning Advisory Committee (Committee) consisting of:

(1) The Commander, Sea Based Antisubmarine Wings, Atlantic Fleet, of the United States Navy, or his disignee.

(2) The Director, Aviation Division of the Jacksonville Port Authority, or his designee.

(3) The Bio-Environmental Services Officer of the City's Bio-Environmental Services Division, or his designee, who shall act as Chairman of the Committee.

It shall be the responsibility of each of the abovereferenced members of the Committee to notify the Director of Planning of his name and mailing address.

(b) Whenever a request for a variance has been filed with the Planning Commission affecting lands subject to this part, the Commission shall refer the matter to the Airport Zoning Advisory Committee for an advisory opinion. Whenever the Commission is required to interpret the provisions of this part and to promulgate rulings, regulations and orders necessary for the implementation thereof, it shall,

before making a final interpretation, ruling, regulation or order, refer the matter to the Committee for an advisory opinion. The Committee shall render a written opinion no later than fourteen days after receipt of a written request from the Commission.

Section 2. The Council finds that the notification of owners of property being affected and owners of property lying within three hundred feet of lands affected by this ordinance and the posting of signs regarding consideration of this ordinance is unnecessary and impractical. Consequently pursuant to the provisions of s. 656.243, Ordinance Code, the requirement for notification of property owners and the posting of signs contained in s. 656.240, Ordinance Code is made inapplicable to the consideration and enactment of this ordinance.

Section 3. Zoning exceptions and zoning variances to the former Part 10, Chapter 656, Ordinance Code, which was declared to be void and invalid by the Opinion of the First District Court of Appeal, filed March 8, 1984, Case No. AG-317, which were granted by the Planning Commission or its predecessors before the invalidations of the former Part 10, Chapter 656, Ordinance Code and which are in effect on the effective date of this ordinance shall continue in effect according to their terms until modified, terminated, superseded, set aside or revoked by the Planning Commission or otherwise in accordance with law, by their terms or by operation of law.

Section 4. The Zoning Atlas is amended in order to overprint the Airport Noise and Accident Potential Zones as the same are referenced in Section 1 of this ordinance upon the appropriate panels of the Zoning Atlas. Panels 2, 11, 10, 14, 17, 20, 19, 18, 13, 7, 8, 9, 6, 5, 4, 1, 27, 30, 31, 36, 39, 40, 45, 44, 41, 38, 35, 32, 29, 26, 25, 28, 33, 34, 34A, 37, 42, 43, 109, 100, 100A, 99, 91, 76, 75, 69, 68, 74, 74B, 77, 78, 88, 90, 96, 97, 101, 108, 106, 107, 49, 48, 118, 131, 277, 278, 281, 291, 284, 283, 272, 129, 128, 119, 116, 115, 120, 121, 122, 123, 124, 125, 127, 126, 273, 270, 282,286, 285, 287, 290, 288, 289, 457, 445, 444, 318, 317, 316, 315, 314, 311, 508, 511, 512, 513,

510, 509, 505, 514, 504, 498, 551, 551A, 547, 547A and 548 upon which the overprints appear, which are currently in the possession of the Council Secretary, are hereby substituted for the corresponding panels currently in the Zoning Atlas and they are hereby constituted official panels of the Zoning Atlas pursuant to Section 656.202 of the Ordinance Code of the City of Jacksonville.

Section 5. This ordinance shall become effective upon being signed by the Mayor or upon becoming effective without the Mayor's signature.

Form Approved:

Phillip S. Cope
Assistant Counsel

General Counsel

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